Virginia Coastal Zone Management Program

Final Draft
Section 309 Needs Assessment
October 20, 2005

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Part I.
Introduction

The Virginia Coastal Zone Management Program was established in 1986 as the state's response to the federal Coastal Zone Management Act of 1972. The Department of Environmental Quality (DEQ) serves as the lead agency of a network of state agencies that administer state regulations and policies to protect and enhance coastal resources. Agencies in the network include the Virginia Department of Agriculture and Consumer Services (VDACS), the Department of Conservation and Recreation (DCR), the Department of Forestry (DOF), the Department of Game and Inland Fisheries (DGIF), the Department of Health (VDH), the Department of Historic Resources (DHR), the Department of Transportation (DOT), the Virginia Economic Development Partnership (VEDP), the Virginia Institute of Marine Science (VIMS), the Virginia Marine Resources Commission (VMRC), Tidewater localities, and Coastal Planning District Commissions (PDCs).

Section 309 of the Coastal Zone Management Act (CZMA) is known as the Coastal Zone Enhancement Program. Created in 1990, Section 309 is a voluntary grant program in which federal funds are available to coastal states with federally approved coastal management programs. To receive funds, the programs must assess nine specified areas of coastal zone management as they relate to the state and identify which are the highest priorities. The nine areas are: public access, coastal hazards, ocean resources, wetlands, marine debris, cumulative and secondary impacts of growth and development, special area management planning (SAMP), energy and government facility siting, and aquaculture.

In 1997, Virginia developed a three-year Assessment and Strategy that addressed each enhancement area of Section 309 and identified five high priority areas (public access, hazards, cumulative and secondary impacts, SAMPs, and aquaculture). These areas were selected based on the recognized need for regulatory or program changes. Based on the highest priority of need and likelihood for success, three strategies were developed for the FY'97-FY'99 period: SAMPs for Northampton and Southern Watershed Areas, and Aquaculture.

In 2000, Virginia developed a five-year Assessment and Strategy that identified five high priority areas with seven proposed strategies: 1. Wetlands: Wetlands Regulatory Programs Strategy; 2. Coastal Hazards: Dune Management Strategy; 3. Cumulative and Secondary Impacts: Shorelands Management Strategy and Clean Marina Program Strategy; 4. SAMP: Southern Watershed Area Strategy and Dragon Run Area Strategy; and 5. Aquaculture: Aquaculture Management Strategy.

This report presents the Virginia Coastal Zone Management Program's 2005 Assessment of the nine enhancement areas. The analysis was completed using the National Oceanic and Atmospheric Administration's (NOAA) final Section 309 Guidance (March 28, 2005). Assessment questions were developed by NOAA in consultation with states and territories to help determine and update the status of each enhancement area.

The Coastal Policy Team, comprised of the agencies noted above, met on September 26th, 2005 to review and prioritize the nine enhancement areas. The Coastal Policy Team used the criteria listed below for determining the priority for each area. Team members individually ranked each area on scoring sheets, considering each area on its own merits. Individual scores were combined and the overall ranking of the areas posted for reflection and discussion by Coastal Policy Team members. The Coastal Policy Team discussed whether any enhancement area should be re-ranked, and then used group consensus to assign a final priority for each enhancement area.

List of Criteria:

1. Feasibility:
    a. Could progress be made within the time and financial constraints?
    b. Is successful development of enforceable policies likely?
    c. Is adoption of enforceable policies likely?
2. Importance:
    a. Is there a significant threat in this enhancement area?
    b. How valuable (economically or ecologically) is the coastal resource?
3. Appropriateness for the Coastal Program:
    a. Is this an issue that other agencies are not addressing?
    b. Is there a need for coordination of efforts within Virginia?

The prioritization effort resulted in the assignment of six high and three medium priorities for the nine enhancement areas. No area was assigned a low priority in this assessment, reflecting the increasing pressures from growth, urbanization, and the resultant declining water quality and habitat loss. The Virginia Coastal Zone Management Program plans to focus its attention and efforts during the next five years on the following six enhancement areas receiving a high priority ranking during the Coastal Policy Team meeting on September 26th, 2005 *: Wetlands, Public Access, SAMPs, Aquaculture, Coastal Hazards and Cumulative and Secondary Impacts of Growth and Development.*

Once this Assessment is finalized, the Virginia Coastal Zone Management Program will be soliciting input from its partners and constituencies to develop strategies to address specific issues in each of these six high priority areas that are deemed appropriate for Virginia CZM action. Focus groups will be convened on each topic and potential strategies developed. Based on feasibility and available Section 309 funding over the next 5 years, several strategies may be pursued.

Part II.

SUMMARY OF PAST SECTION 309 EFFORTS

(2001-2005)

PART II. SUMMARY OF PAST SECTION 309 EFFORTS (2001-2005)

Wetlands Assessment

Strategy: Enhancement of Wetlands Regulatory Program

Legislation passed by the 2000 Virginia General Assembly gave the Department of Environmental Quality (DEQ) a mandate to revise the existing Virginia Water Protection Permit regulations to enable DEQ to regulate certain activities in nontidal wetlands which were not under federal jurisdiction. DEQ was also given the authority to consider cumulative impacts to water quality and to fish and wildlife resources, and to ensure that all permits that allow wetland impacts address no net loss of wetland acreage and function. During the previous Coastal Needs Assessment it was determined that several significant program enhancements would be necessary to ensure full implementation of this new wetlands authority. Specifically, the Assessment recommended development of a methodology and protocol for 1) assessment of cumulative impacts and 2) for evaluation of compensation requirements and success rates. Absent these protocols, it was felt that the DEQ nontidal wetland regulatory program would not be able to effectively assess whether it had met its stated goals of ensuring that cumulative impacts to water quality and fish and wildlife resources were addressed and minimized and that there was no net loss of wetland acreage and function.

As a result of this identified need, the Virginia Institute of Marine Science (VIMS) received a series of grants to develop a cumulative impact assessment protocol and a compensation monitoring protocol. Although significant delays were experienced due to data format problems, both protocols are nearing completion and implementation.

Coastal Hazards

Strategy: Enhanced Dunes Management

The dune systems of Virginia are considered a unique and valuable natural resource because of their shoreline erosion defense and habitat qualities. The Commonwealth enacted the Coastal Primary Sand Dune Protection Act in 1980 to help protect these resources and expanded it in 1989 to include sandy beaches above mean high water. A number of gaps have been identified, however, in the management framework for dunes and beaches as well as in the scientific data available to support resource management. To address these gaps, this strategy pursued a multi-pronged approach and resulted in a much better understanding of Virginia's dune and beach resources, and recommendations for improved management.

Results of this strategy included:

- Local dune inventories for each of the localities included in the Coastal Primary Sand Dunes and Beaches Act
- An assessment of changes to dune systems over time and analysis of the factors that affect those changes
- Development of a dune classification system
- An analysis of the connection between primary and secondary dunes

- An expanded dune inventory beyond the nine localities currently covered by the Dune Act
- Monitoring of selected dune systems to determine profile change, vegetation analysis and degree of protection dunes offer to adjacent lands
- A definition and parameters for delineating secondary dunes
- A risk assessment for secondary dune sites from upland development
- An analysis of the shoreline protection and groundwater flow properties of dunes
- Development of a dunes website
- Shoreline evolution reports for 11 localities identified as having coastal primary dunes
- An assessment of supratidal beaches currently outside of state jurisdiction

Cumulative and Secondary Impacts

Strategy: Enhancement of Shoreland Management

Development of our waterfronts, while not the largest source of pollution to coastal waters, can be detrimental to some of the very resources that draw people to the waterfront. Increased nutrients from septic systems and lawn fertilizers, along with sediment washing from the land have clouded the water. Increased boat traffic has also affected water quality and helped wash away important marshes and underwater grass beds. Additionally, manicured lawns and hardened shorelines have replaced many of the natural buffers and wetlands that helped clean rainwater runoff, stabilize the shore, and provide important wildlife and fish habitat.

Many localities do not have the capability to assess the impacts of waterfront development on the adjacent aquatic resources. This project was developed to provide localities with both guidance on the impacts of shoreland development to aquatic habitats and a GIS-based tool to evaluate the potential impacts from development along the shoreline. While some adjustments had to made to the project outcomes because of lack of information availability, this project resulted in:

- A *Better Land Use Planning in Coastal Virginia* guide and brochure
- A draft GIS protocol for evaluating relative impacts to habitat and water quality from shoreland development
- A pilot GIS project that assessed conditions in one embayment in Lancaster County

The Better Land Use Planning in Coastal Virginia materials can be found on the web at: http://www.cblad.virginia.gov/Shorelands/cbladShorelandshome.htm

Strategy: Enhancement of Clean Marina Program

The Virginia Clean Marina Program is a voluntary recognition program for marinas that take an extra step to protect the Commonwealth's coastal resources. The Virginia Institute of Marine Science (VIMS) has operated the Clean Marina Program (CMP) since 2000. The Virginia Coastal Zone Management Program has been the sole source of funding for this program, the first 3 years through Section 309 funding and the last 2 years through the Coastal Nonpoint Pollution Control Program (Section 6217 of the CZMA). VIMS has sought other

permanent long-term sources of support for the program but has been unsuccessful thus far. There is great support for this Program throughout the marine industry and a strong commitment from the Advisory Committee to sustain program activities.

The Program provides technical assistance to marina operators by working closely with them to meet the program criteria. Many marinas have employed innovative practices that have earned them Clean Marina Designation. The Program also educates boaters through participation in trade shows and workshops. At the regional level, the Program has been coordinating closely with Maryland, Delaware, Washington, D.C., and the National Park Service, as members of a regional workgroup, to identify and work on common goals concerning water quality in the Chesapeake Bay. Since 2001:

- 22 marinas have been designated as Virginia Clean Marinas
- 31 additional marinas have pledged to meet the criteria for designation
- Over 25% of the 16,800 boat slips in Virginia are currently participating in the CMP
- 2 issues of the newsletter, *Smart Harbor*, were produced and distributed to over 300 marinas

For more information, including Clean Marina Success Stories, visit the Virginia Clean Marina Program's Web site at: http://www.virginiacleanmarina.com/

Special Area Management Plans (SAMP)

Strategy: Southern Watersheds

The Southern Watershed Area Management Program (SWAMP) was designed to protect and enhance the natural resources, sensitive lands and water supplies of the Southern Watersheds of the cities of Virginia Beach and Chesapeake. The Southern Watersheds encompass approximately 325 square miles and include the watersheds of Back Bay, the Northwest River and the North Landing River. The program has progressed through several stages over many years, with the Virginia Coastal Zone Management Program becoming involved in 1992. The program is intended to address coastal management problems in three specific areas: existing threats to water quality, habitat loss and water quality degradation due to development, and use/management conflicts.

The program has had the following successes during the period of 2001 to 2005:

- A Technical Advisory Committee has begun implementing the Multiple Benefits Conservation Plan Memorandum of Agreement.
- Educational materials have been developed as part of the north Landing River Water Use Conflict Memorandum of Agreement.
- An educational brochure and signs have been developed as part of the Back Bay Water Use Conflict Educational Package.
- SWAMP research materials have been included in the Chesapeake and Virginia Beach comprehensive plans.
- An Open Space and Agricultural Preservation Program in Chesapeake has resulted in a purchase of development rights program that included prime agricultural lands and conservation lands identified in SWAMP research.

- The "Preserve on the Elizabeth," a conservation subdivision in the Southern Watershed area based on a site plan designed by Randall Arendt as part of SWAMP, was approved and is under construction.

Strategy: Dragon Run Watershed

As one of the Chesapeake Bay watershed's most pristine waterways, the Dragon Run flows forty miles along and through nontidal and tidal cypress swamp situated in portions of Essex, King and Queen, Middlesex, and Gloucester Counties. The Dragon Run plays a central role in the Middle Peninsula's culture and identity. Natural resources - forestry and farming - have been the bedrock of the watershed's economy. These land uses, together with extensive swamps and unique natural resources, are the main reasons that the Dragon Run remains wild and secluded.

The Dragon Run's unique character evokes strong feelings to protect the pristine watershed in both long-time residents and first-time visitors alike. Yet, opinions differ about how to address the threats of encroaching development and habitat fragmentation. An innate difference in point of view between property rights advocates and conservationists centers on how to maintain a pristine watershed into the future. Yet, substantial common ground exists for proactively preserving the Dragon Run for future generations.

The Dragon Run SAMP's mission is to support and promote community-based efforts to preserve the cultural, historic, and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed. While the Dragon Run landscape is primarily undeveloped, changes in land ownership threaten to fragment productive farm and forest land and natural habitat and disrupt the local natural resource based economy. The SAMP is designed to address both the differences of opinion and the common ground that exist concerning the future of the watershed.

This proactive planning effort has resulted in many successes:

- Adoption by the four counties in the watershed of an Memorandum of Agreement that states the goals and objectives of the SAMP
- Establishment of a citizen-driven stakeholder participation process for developing a comprehensive watershed management plan.
- Adoption of the Watershed Management Plan as an addendum to the county's Comprehensive Plan by 3 of the 4 counties
- Development of model zoning and comprehensive plan amendments for each county to consider and to customize to achieve consistency with the principles in the watershed management plan
- Establishment of an annual Dragon Run Day that celebrates landowner stewardship and the watershed's natural cultural and historic heritage.
- Administration of an education and outreach program targeted at giving local decision makers and community leaders a hands-on watershed experience
- Recommendations for management of public and non-governmental organization (NGO) holdings acquired for conservation underway.
- Presentation of sustainable economic development opportunities to local business, governments and landowners underway.

- Establishment of an invasive species initiative made up of a coalition of universities, federal and state agencies, regional government and NGOs.
- Establishment of baseline information on the status of the natural resources and land use planning policies in the four counties.

More information on the Dragon Run SAMP can be accessed via the Web site at: http://www.mppdc.com/dragon/index.shtml

Strategy: Northampton County

The Northampton County SAMP began in the early 1990s in an effort to protect migratory songbird habitat, public access and water quality. In addition, it sought to foster sustainable economic development in what ranks as one of the poorest counties of Virginia's coastal zone.

Although several program changes were accomplished and reported in the April 2001 Assessment & Strategy, several originally identified program changes were not. Most important among those was adoption of a vegetation ordinance that would restrict removal of existing native shrubs and trees in the County in an effort to protect both song bird habitat and water quality. Unfortunately when the proposed ordinance was brought before the County Board of Supervisors for a vote in the late 1990s, it was defeated. During the 2001 – 2005 period the Coastal Program offered the County a second chance to adopt a vegetation ordinance and three grants were developed. The first two grants (FY 1999 Task 92 and FY 2000 Task 92) were for ordinance development and education efforts and the third (FY 2003 Task 96) was for implementation of the adopted ordinance. Using the FY 99 and 00 grants, the County established a new citizen committee and hired a new planner to guide the development of a revised "Sensitive Natural Resource Area Preservation Overlay District." Multiple public meetings were held, and a brochure developed that explained the purpose of the overlay district in protecting both groundwater and natural vegetation and wildlife communities. Once again an ordinance was brought before the Board of Supervisors for adoption. Once again, the Board failed to adopt the ordinance. The FY 2000 grant had been conditioned such that failure to adopt the ordinance would result in repossession by the Virginia Coastal Program of the plotter purchased with grant funds and withholding of $25,000 from the FY 2000 grant. Also, due to the County's failure to adopt, the FY 2003 grant was never awarded.

Perhaps the greatest success of the Northampton SAMP has been the increased recognition the area is receiving for its ecological importance – particularly as a critical stopover habitat for migratory birds. As a result of the research conducted under the SAMP, major conservation organizations such as The Nature Conservancy and the US Fish & Wildlife Service are now investing in major protection efforts. Recently the global headquarters office of TNC approved the allocation of about $13 million to purchase land on the southern tip of the county. In addition, the national office of the USFWS approved the expansion of the Eastern Shore Refuge's acquisition boundary to include all those areas identified as critical songbird migratory habitat through the Northampton SAMP. It may also be fair to say that although the County Board of Supervisors still has not adopted a habitat protection ordinance, the makeup of the Board is now far more supportive of such efforts because of the work conducted under the Northampton SAMP.

Aquaculture

Strategy: Enhancement of Aquaculture Management

During the last 10 years, The Virginia Coastal Zone Management Program, the Virginia Institute of Marine Science, and the Virginia Marine Resources Commission have undertaken many steps towards a comprehensive aquaculture management program in Virginia including: 1) evaluating potential conflicts between clam aquaculture and submerged aquatic vegetation; 2) the identification of potential conflicts in environmental policies related to aquaculture; 3) the establishment of a general permit for noncommercial shellfish operations; 4) the development of regulations for off-bottom activities; and 5) educational materials related to marine aquaculture.

Entering the last 309 funding cycle (2001 to 2005), there were two primary challenges remaining in the development of a comprehensive aquaculture management program including; 1) the development of guidance ensuring aquaculture activities occur in the most appropriate locations which may ultimately be incorporated into the review of permit applications, and 2) the development of guidance/regulations for the integration and coordination of the many aquaculture management programs in the Commonwealth.

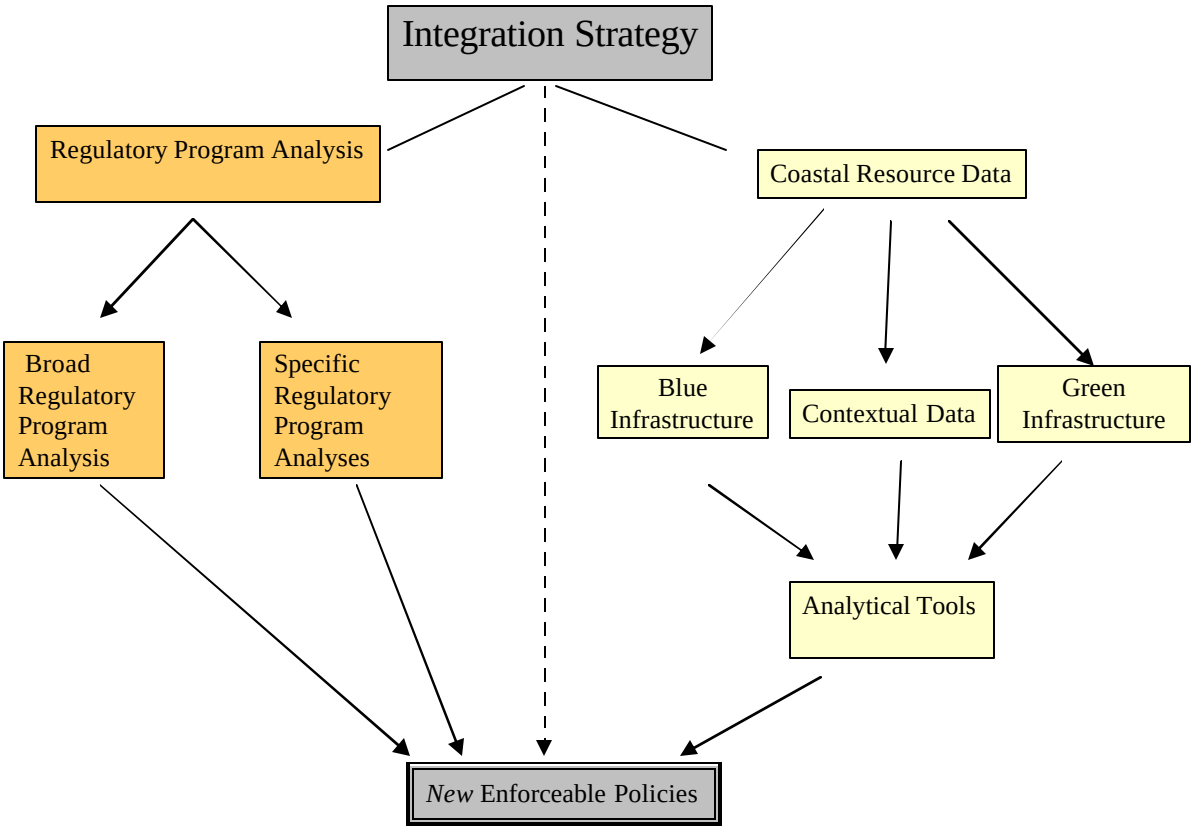
During 2001, the General Assembly also passed Joint Resolution HR765 that charges VIMS, VMRC, and other supporting agencies with preparing a management plan for shallow water areas in the Chesapeake Bay to reduce use-conflicts and promote the continued development and long-term sustainability of aquaculture operations. The following is a summary efforts undertaken by VIMS and VMRC towards the development of shallow water management strategy and more effective regulations for the management of clam and oyster aquaculture in the Commonwealth's estuarine and coastal waters.

- Management issues were identified and characterized through meetings and discussions with the Aquaculture Management Advisory Committee
- Based on literature review and extant scientific knowledge and data, environmental suitability criteria for hard clam and oyster aquaculture sites were identified.
- GIS based use-suitability models were developed to locate optimal and suitable aquaculture sites.
- The frequency of occurrence and co-occurrence of various conflicts and issues were assessed based on the GIS use-conflict analysis.
- A thorough review of existing regulatory authorities for aquaculture management were undertaken to identify gaps in the current regulatory environment.
- Management strategies appropriate for various use-conflict scenarios were listed and evaluated for relative effectiveness.
- VMRC drafted an amendment, Water Column Leases for Aquaculture Purposes, which authorizes VMRC to "lease the water column above certain state-owned bottomlands for aquaculture purposes." On April 15, 2004, the Virginia General Assembly approved the amendment to Chapter 16, Title 28.2 of the state code. Once funded, this amendment will provide the aquaculture industry with necessary water rights and protection while minimizing potential conflicts with other user groups and existing natural resources. However, the bill is only effective if the General Assembly earmarks state funding for the specific purpose. As of July 1, 2005, funding was not provided for fiscal year 2006.

Integration Strategy Concept

August 11, 2005

Overview of the general design of the Integration Strategy, showing the Regulatory Program Analysis and Coastal Resource Data components and how these components should all link together into the development of New Enforceable policies



Strategy: Enhancement of Blue Green Infrastructure Data

There is often an apparent disconnect between local land use policies and state water policies that is only exacerbated by continuing to look at each resource separately. The Coastal Program's "Integration Strategy" was developed to create practical linkages among agencies or levels of governments regarding issues dealing with coastal resource management. The Integration Strategy clearly meets two Virginia Coastal Program goals including:

- Goal 9: "To *avoid and minimize coastal resource use conflicts* through research, planning and a forum for coordination and facilitation among government agencies, interest groups and citizens."
- Goal 10: "To *promote informed decision-making* by maximizing the availability of up-to-date educational information, technical advice and scientific data."

To assist in coordinating each agency's management goals/programs for coastal resources in Virginia, we felt we needed an inventory of the important water and land-based natural resources required to support the functioning of our coastal ecosystems. This coastal resource infrastructure would serve as a framework for prioritizing issues, concerns and/or management efforts for coastal resource protection.

With the assistance of Virginia's state agencies, universities, and the planning district commissions, the Virginia Coastal Program has begun using GIS technology to map the "best" remaining blue and green infrastructure in Virginia. These are resources that should be considered in coastal resource management decisions (e.g. rare or sensitive habitat location(s), oyster reefs, a public access site, a large tract of forest land etc.). There is also an understanding that certain "contextual" data (for example: shoreline erosion rates, human population growth data, and water quality trends) will need to be collected to help analyze our coastal resource data and develop or enhance planning tools.

The Virginia Coastal Zone Management Program is currently contracting with Virginia Commonwealth University for the development of the Blue-Green Mapping Portal to organize and display blue and green infrastructure data layers that meet individual agency needs for coastal resource management. This will support the Coastal Program's efforts to create an online mapping system that would be a web accessible "one-stop shop" for publicly-available coastal resource data.

The following is a list of projects which have generated or will generate coastal resource data to be included in the new Coastal Program Blue-Green Mapping Portal (also see Integration Strategy diagram below).

"Blue" Infrastructure Data Development Includes:

- *Blue Infrastructure Criteria and Needs Assessment Project (underway)*:
  - Outgrowth of discussions among the Blue Infrastructure Advisory Committee
  - Data layers currently available include Anadromous fish streams; Aquaculture sites; Baylor Grounds; Blue crab sanctuary; Nearshore areas adjacent to coastal parks or natural area preserves (from NOAA's Marine Management Areas List); Oyster reefs; Public Access (DGIF); Public beaches (with buffers); Private Leases; SAV beds; SAV restoration goal (185,000 acres); Tidal mudflats and Threatened and endangered waters
  - For further details see: http://ccrm.vims.edu/blueinfrastructure/bi_intro.html
- *GIS Conversion of MRC Fisheries Data Project (underway):*
  - Provides additional data layers for Blue Infrastructure
  - Conversion of VMRC AutoCad data files to a standard GIS shape file format.
  - Datasets include clam sanctuaries, crab sanctuaries, oyster seed beds, red drum sanctuaries, shellfish management areas, and striped bass sanctuaries.
- *INSTAR (Interactive Stream Resource Assessment)(complete):*
  - INSTAR is an interactive online tool developed by Virginia Commonwealth University's Center for Environmental Studies. INSTAR provides access to an extensive dataset for stream reaches throughout Virginia's coastal zone, including instream habitat and stream geomorphology. INSTAR has the capability to model streams in the coastal zone and assign 'stream health' values. http://instar.vcu.edu/about.htm

"Green" Infrastructure Data Development Projects Include:

Green Infrastructure Priority Maps Project (completed):

- Based on Maryland's Green Infrastructure Project, the Virginia Landscape Needs Assessment (VANLA) uses land cover data derived from satellite imagery to identify ecologically significant hubs (large tracts of natural areas) and corridors (narrower strips of lands that connect the hubs) that can be prioritized for various protection and management needs.

Green Infrastructure GIS Project (underway):

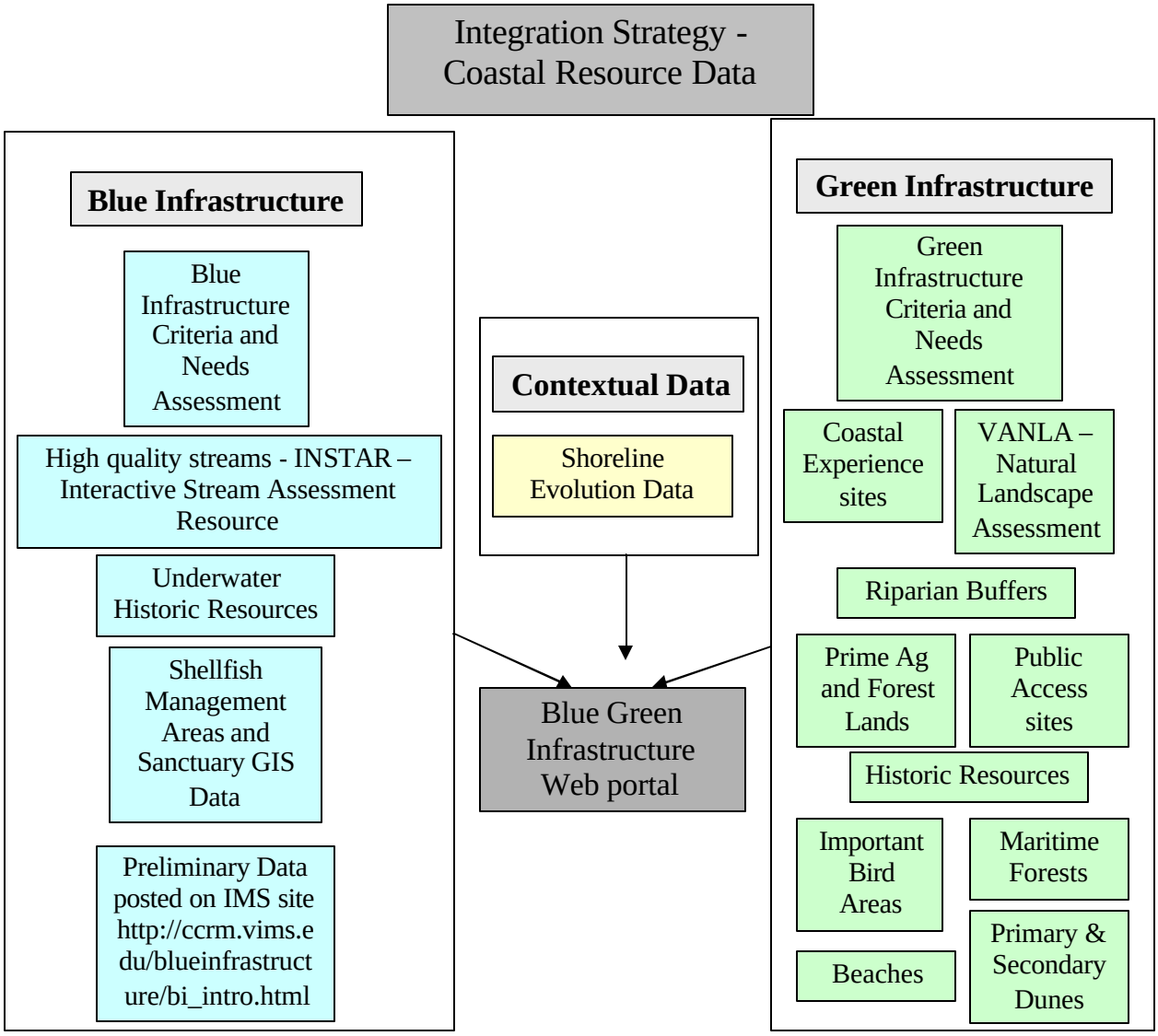
- Green Infrastructure Advisory Workgroup composed of key Coastal Partners
- Revising current VANLA using the RESAC land cover data developed by the University of Maryland for the entire state of Virginia.
- Attempt to identify, assemble or create additional geospatial datasets to address the varied conservation interests and needs of all the coastal partners (based on RLA).
- Potential datasets include those related to forest lands, water quality, prime agricultural lands, historical/cultural resources, and lands with recreational value.

Maritime Forest Inventory and Risk/Restoration Assessment Project (underway):

- An analytical technique for inventorying and prioritizing coastal maritime forest restoration sites.
- Develop a coastal zone wide inventory of coastal maritime forests.
- Assess the potential risk to these forests and prioritize sites for protection/restoration (identified as the Southern Watersheds).

Important Bird Area Synthesis Project (underway):

- The Important Bird Areas (IBA) program is an international, science-based initiative to identify, conserve, and monitor sites that provide essential habitat for bird populations using international criteria.
- The Center for Conservation Biology proposes to work with the IBA program to identify and establish a network of conservation sites in coastal Virginia.


Integration Strategy - Coastal Resource Data
Blue Infrastructure
Blue Infrastructure Criteria and Needs Assessment
High quality streams - INSTAR – Interactive Stream Assessment Resource
Underwater Historic Resources
Shellfish Management Areas and Sanctuary GIS Data
Preliminary Data posted on IMS site http://ccrm.vims.edu/blueinfrastructure/bi_intro.html
Contextual Data
Shoreline Evolution Data
Blue Green Infrastructure Web portal
Green Infrastructure
Green Infrastructure Criteria and Needs Assessment
Coastal Experience sites
VANLA – Natural Landscape Assessment
Riparian Buffers
Prime Ag and Forest Lands
Public Access sites
Historic Resources
Important Bird Areas
Maritime Forests
Beaches
Primary & Secondary Dunes

Strategy: Regulatory Programs Analysis

Because Virginia operates a networked coastal program comprised of many individual programs housed in separate agencies, coordination and cooperation to achieve common goals is critical for minimizing the cumulative and secondary impacts of individual management decisions. Managers at the state, federal and local levels have recognized the need to ensure that objectives are consistent, and that decision making is always cognizant of potential unintended consequences of other programs' goals. Through this strategy, several coastal resource topics have been analyzed to identify these unintended consequences and recommendations have been made to fill management gaps or coordinate overlapping management programs. Two of the topics, Enhanced Dunes Management and Enhancement of Aquaculture Management are described in detail in under the Coastal Hazards and Aquaculture sections of this summary. Several initiatives were also undertaken within the topic of improved shoreline management. These included an Analysis of Shoreline Erosion Control report and an Interagency Consensus Document on Shoreline Management. Each of these efforts has resulted in improved coordination and better resource management.

Part III

ENHANCEMENT AREA ANALYSES

PART III. ENHANCEMENT AREA ANALYSES

Public Access

Section 309 Programmatic Objectives

I. Improve public access through regulatory, statutory, and legal systems.
II. Acquire, improve, and maintain public access sites to meet current and future demand through the use of innovative funding and acquisition techniques.
II. Develop or enhance a Coastal Public Access Management Plan which takes into account the provision of public access to all users of coastal areas of recreational, historical, aesthetic, ecological, and cultural value.
IV. Minimize potential adverse impacts of public access on coastal resources and private property rights through appropriate protection measures.

Resource Characterization

Extent and Trends in Providing Public Access (publicly owned or accessible):

1. Provide a qualitative and quantitative description of the current status of public access in your jurisdiction. Also, identify any ongoing or planned efforts to develop quantitative measures to assess your progress in managing this issue area.

Access Type	Current Number(s)	Change Since Last Assessment
State/County/Local Parks (# and acres)[1]	859 parks, 171,621 acres	
Beach/Shoreline Access Sites (#)	34 Sites[2]	
Recreational Boat (power or non-power) Access Sites (#)[3]	233[4]	+124
Designated Scenic Vistas or Overlook Points (#)	9	N/A
State or Locally Designated Perpendicular Rights-of-Way (i.e. street ends, easements) (#)	326 in the Middle Peninsula[5]	N/A
Fishing Points (i.e. piers, jetties) (#)[6]	153	-2

[1] This data totals City Parks, Local Parks, Regional Parks, Community Centers, Local Battlefield Parks, Reservoirs, State Parks, State Natural Area Preserves, State Forests, State Wildlife Management Areas, State Museum Estates. For exact numbers for each type, see text below the chart.
[2] The current data is from the Chesapeake Bay Public Access Guide.
[3] Previous assessments counted only DGIF boat access sites. The current assessment includes access sites owned by localities and other state agencies as well as privately-held ramps that are open to the public. This differentiation accounts for the gap between years. This data is from the 2005 update of the Chesapeake Bay Public Access Guide.
[4] About 80% of recreation boat access sites are for power boats.
[5] Road endings in the Middle Peninsula Planning District were inventoried in 2003. While this number will vary across the coastal zone, this is a significant potential resource for providing public access and some localities are beginning to address this issue.

Access Type	**Current Number(s)**	**Change Since Last Assessment**
Coastal Trails/Boardwalks (# and miles)	56 sites[7]	-23
ADA Compliant Access (%)	N/A	
Dune Walkovers (#)	N/A	
Public Beaches with Water Quality Monitoring and Public Notice (% of total beach miles) and Number Closed due to Water Quality Concerns (# of beach mile days) Number of Existing Public Access Sites that have been Enhanced (i.e. parking, restrooms, signage - #)*	100%[8] of public Beaches have water quality monitoring 34 Beach Mile Days of Advisories (2004)[9] Unknown	

There are 795 City, Local, and Regional Parks in Virginia covering 84,182 acres of land; 5 reservoirs covering 877 acres; 5 State Forests covering 8784 acres, 19 State Natural Area Preserves covering 25,457 acres; 13 State Parks covering 23,066 acres; 13 State Wildlife Management Areas covering 28,703 acres; 4 Local Battlefield Parks covering 143 acres; 1 State Museum Estate covering 374 acres; and 4 Community Centers covering 34 acres.

Water trails, while not counted for this assessment, are becoming a more popular way to provide public access to the water. A water trail is defined as "a stretch of river, a shoreline, or an ocean that has been mapped out with the intent to create an educational, scenic, and challenging experience for recreational canoeists and kayakers.[10]" DCR is currently working with the National Park Service to get the Chesapeake Bay declared a National Historic Water Trail.

There are currently 233 publicly-owned public access sites in Virginia.

2. Briefly characterize the demand for coastal public access within the coastal zone, and the process for periodically assessing public demand.

Virginia has a wealth of coastal resources and an overwhelming demand for access to those resources. There are more than 5,300 miles of shoreline and 2,400 square miles of tidal bays on the Virginia coast. The 2000 Virginia Outdoors Survey found that four of the top ten most popular outdoor recreational sites are water related: swimming (3rd), fishing (4th), sunbathing

[6] This data comes from the 2005 update of the Chesapeake Bay Public Access Guide. The decrease from the previous assessment is because the current data does not overlap with boat access sites.
[7] The discrepancy in this data comes from way the data was counted. These coastal trails are trails that have access to the coast, while trails reported in 2001 were simply trails within the coastal zone. Water Trails are not included in this count.
[8] The 100% refers to all beaches covered under the federal Beach Act of 2000.
[9] These are beach advisories, not closures. There were no beach closures due to water quality.
[10] Definition from North American Water Trails, Inc.

(7th), and boating (8th). However, less than 1% of the shoreline is publicly owned, resulting in overcrowded beaches and overused boat ramps. This fact is evident in the Virginia Outdoors Survey finding that more than 57% of Virginians are most concerned about increasing the number of water access points, which the Survey identifies as Virginia's greatest outdoor recreational need.

The *Virginia Outdoors Plan* (VOP), developed by the Department of Conservation and Recreation (DCR) and funded through a grant from the National Parks Service, is the official conservation, outdoor recreation, and open space plan for Virginia. It is also the primary source of public access data for the state. Updated every five years, the plan is meant to advise government agencies and the private sector in planning for Virginia's conservation, outdoor recreation, and open space needs. The plan compiles data from the various Virginia localities on various types of public access and compares it to the data from the Virginia Outdoors Survey. The Virginia Outdoors Survey asks questions pertaining to participation in different types of outdoor recreation activities.

The VOP, most recently published in 2002, is currently being updated for release in 2007. The results from the 2005 Virginia Outdoors Survey are scheduled to be published in September of 2006.

3. Identify any significant impediments to providing adequate access, including conflicts with other resource management objectives.

Of the 66 additional public water access sites called for in the *Chesapeake Bay Agreement* in 2000, only 15 sites had been developed by 2004. Some of the impediments to providing new public access sites follow.

- Development pressures: There are two issues here. First, waterfront property is in high demand and can be a financially profitable alternative for localities to creating emotionally and environmentally profitable public access sites. Waterfront property in some parts of the coastal zone has appreciated an average of 400% over six years.[11] Related to this, private landowners who have allowed public access to watermen for generations now often cannot afford to pay the property taxes associated with the rapid appreciation and may be forced to sell their property. New owners without this historic relationship with the watermen can block water access through their property.
- A recent trend along the coast has been the "privatization of the shoreline." For example, marinas for *public* boat access are being redeveloped into condominium complexes with *private* boat access.
- Potential use conflicts between providing access and protecting sensitive resources: For example, boat wakes are significant cause of erosion in smaller tidal creeks.
- While often supporting creation of public space for larger tracts of preserved open space and greenways, the public, especially private landowners, frequently oppose potential public access sites near their property for fear of litter, vandalism, and crime, even though such public access may require as little as one-quarter acre. The importance of trash as an issue should not be underestimated. This fear is often misplaced as experience has indicated that users of public trails and other public open space often are willing help to maintain the site.

[11] Data estimated from initial data from 2005 Northumberland and Westmoreland County real estate assessments.

- Political pressures are also often an impediment to creating new public access sites. The limited resources at the local level are often used for projects other than public access improvement. Without vocal support from the public, localities are hesitant to spend scarce resources on public access.

4. Please explain any deficiencies or limitations in data.

The Virginia Outdoors Survey was conducted in 2000; so much of the data about public interest in public access is five years old. Furthermore, when assessing demand, there are factors other than the number of access sites that would help determine whether access is sufficient to meet demand. For example, the carrying capacity of a site is often directly proportional to the size of the parking lot. Therefore, some sites may be able to accommodate more or less people than assumed, but the Virginia Outdoors Survey does not provide this kind of additional information. Also, timing is a important issue for determining sufficiency of access. For people who launch their boats only during high traffic times, e.g. holidays, long weekends, it is likely that they would find that a need for additional public access while those who launch during week days would find access adequate. However, the Virginia Outdoors Survey does not provide information on off-season to peak use fluctuations and how this impacts the need for public access.

Another example of a deficiency is that data for power and non-power boating access is often combined. The VOP differentiates between the two in some part of the plan, but when demand is assessed, they are lumped together. However, access needs are quite different for each type. Power boats usually require infrastructure such as boat ramps and docks. Non-power boats generally require much less, sometimes simply a dirt path down to the water. Differentiating between these types of access will help to better characterize the demand for each and allocate the proper funds.

5. Does the state have a Public Access Guide or website? How current is the publication or how frequently is the website updated?

Virginia does not currently have a comprehensive public access website. The latest public access map was produced in 2000. It is currently being updated and will be available by the fall of 2005.

Management Characterization

For each of the management categories below, identify significant changes since the last assessment.

Categories:	**Change since last assessment**
1. Statutory, regulatory, or legal system changes that affect public access	None
2. Acquisition programs or techniques	Significant
3. Comprehensive access management planning (including development of GIS data layers or databases)	Significant
4. Operation and maintenance programs	Moderate
5. Funding sources or techniques	Minor

6. Education and outreach (access guide or website, outreach initiative delivered at access sites, other education materials such as pamphlets)	Significant
7. Beach water quality monitoring and/or pollution source identification and remediation programs	None

For categories with changes:
- Summarize the change
- Specify whether it was a 309, 306A, or other CZM driven change and specify funding source
- Characterize the effect of the changes in terms of both program outputs and outcome

2 and 3. Acquisition programs or techniques and Comprehensive Access Management Planning:

Acquisition programs
In 1999, the *Virginia Land Conservation Foundation* (VLCF) was established by Governor Gilmore and the Virginia General Assembly to help fund the protection of Virginia's natural and cultural resources. The foundation manages *Virginia Land Conservation Fund,* state funds which can be used to acquire and preserve open spaces, parks, and natural areas for public access. The VLCF provided with funds in 2005 first time in five years. *(See the Cumulative and Secondary Impacts section for more information)*

Access Management Planning
The Virginia Birding and Wildlife Trail is a driving trail leading to loop trails that highlight the Virginia's diverse wildlife and birds. With funding from a federal TEA-21 grant administered by the Virginia Department of Transportation as well as Coastal Program funds, the Virginia Department of Game and Inland Fisheries (DGIF) manages the collection of trail maps and guides for each area. DGIF also provides technical assistance to public and private landowners who have agreed to join the network of trails. The coastal area contains 18 loop trails that lead to over 210 different natural sites. The Virginia Birding and Wildlife Trail website shows an overview map of the trail as well as more detailed maps for each loop trail. A portion of the project was funded in 2000 with Coastal Program funds.

The Middle Peninsula Public Access Authority (MP PAA) was created in June of 2003. The authority is charged with identifying sites (both privately and publicly owned) with high potential for public access and developing mechanisms to transfer those sites to the Authority for management. Both development of the Authority and many of its implementation activities have been supported with Virginia Coastal Program Section 306 funding. The MP PAA is currently working on strategies for how to transfer ownership of VDOT road endings to the localities. These sites would then be developed into public access sites.

Legislation was passed by the General Assembly in 2005 giving the localities on the Northern Neck the authority to form a Public Access Authority as well. The Authority will be officially created when a locality joins, which is expected to occur in the winter of 2005-2006.

The Chesapeake Bay Program maintains GIS data of various public access sites for the Chesapeake Bay Public Access Guide.

Through the Natural Heritage Program, DCR has created an online GIS mapping application for displaying conservation lands in Virginia. The database includes most federal and state lands, regional and interstate lands such as water and park authorities, parks and undeveloped or partially-developed lands owned by localities, lands owned by non-profit conservation organizations, and conservation easements.

4. Operation and maintenance programs:

The Public Access Authorities (PAA) provide a regional body to plan for and manage holdings. Especially for small rural localities this regional approach can improve how access is managed in the area, by taking advantage of regional expertise and regional priorities. For example, the MP PAA develops site management plans for each of its holdings and can determine appropriate uses of a particular site based on regional needs in the 6-county area.

5. Funding Sources or Techniques:

(See description of VLCF above)
DGIF receives federal Wallop-Breaux and Dingle-Johnson funds from the motorboat fuel tax and the fishing gear tax. These funds go towards improving and adding boating and fishing access sites. They also use boater registration fees towards boating access and safety.

The Middle Peninsula and Northern Neck Planning District Commissions received Coastal Program Section 306 funding to help create their Public Access Authorities.

6. Education and outreach:
The Chesapeake Bay Public Access Guide, assembled by the Chesapeake Bay Program, is currently being updated and will be available in the fall of 2005. The original guide provides information on over 600 public access sites around the bay, including boat access, fishing piers, natural vistas, and beaches. An extension of the public access guide, the Chesapeake Bay Gateways Network website includes a history of the Bay, links to hundreds of Bay activities, maps of the Bay, and various other bits of information.

DGIF manages and updates a search engine for public boat access locations, searchable by county or water body. The website also lists whether there is a ramp and its open status. A similar DGIF site searches for handicap-accessible boating and fishing sites. Also, see the description of the Virginia Wildlife and Birding Trail website above.

The outdoor recreation search on the Virginia Tourism Corporation's web site (www.virginia.org) allows people to search for different outdoor recreation activities by location.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

One gap is the lack of available grant money for comprehensive public access programs. For example, several of DGIF's programs incorporate education and outreach as part of developing and improving public access. However, most federal grants exclude education programs from receiving funds for public access.

Related to this gap may be the need to differentiate between access for motorized and non-motorized boats in state development and management policies. For example, it may be important for the state to identify locations of existing and emerging use conflicts and to develop policies or guidelines for the types of uses most appropriate, differentiating between non-motorized educational or stewardship uses, recreational uses, and income-generating or subsistence uses.

An important need is for improved cooperation between state and local governments on identifying priority public access needs. Local governments often have a better grasp of the access needs of their constituents and can work with state government to provide adequate and appropriate access for their jurisdiction.

Another gap is the lack of clear quantitative data to counteract property owners' fears about increasing public access near or through their properties. If benefits of public access sites near privately-owned property were clearly documented, as well as evidence that such access points could be properly managed, opposition from property owners might yield to acceptance or support for public access. For example, studies about enhanced property values resulting from increased public accessibility could be conducted. Further studies could document the various ways in which communities have successfully managed stewardship of public lands. These studies would be important tools for encouraging and implementing more public access.

Finally, comprehensive data about public access sites are very difficult to come by. It is difficult to plan for additional public access when the conditions of existing sites and their amenities are unclear. The state would benefit greatly from a comprehensive database that would include these types of information about existing public access sites, and which should be updated regularly for changes to public access sites.

2. What priority was this area previously and what priority is it now for developing a 309 strategy and allocating 309 funding and why?

1997 Assessment	2000 Assessment	This Assessment
High _✓	**High** _✓	**High** _✓
Medium ___	Medium ___	Medium ___
Low ___	Low ___	Low ___

Public Access remains a high priority for the Coastal Program. The Chesapeake Bay Program has set aggressive goals to increase the number of sites available in Virginia (over 40 additional sites in the next five years). In addition, there are several state agencies, local governments, and new regional authorities dedicated to providing public access (both sites and information). With all of the activity and the complexity of the issues surrounding public access (i.e. privatization of our coasts, changes in traditional uses, economic value of public access, the consideration of the public trust and the potential environmental consequences of providing access), the Coastal Program could provide some necessary coordination in Virginia.

Coastal Hazards

Section 309 Programmatic Objectives

I. Direct future public and private development and redevelopment away from hazardous areas, including the high hazard areas delineated as FEMA V-zones and areas vulnerable to inundation from sea and Great Lakes level rise.

II. Preserve and restore the protective functions of natural shoreline features such as beaches, dunes, and wetlands.

III. Prevent or minimize threats to existing populations and property from both episodic and chronic coastal hazards.

Coastal Hazards Characterization

1. Characterize the general level of risk in your state from the following coastal hazards:

Hazard	Current Risk	2000 Risk
Hurricanes/typhoons	High	High
Storm surge	High	High
Flooding	High	High
Shoreline erosion (episodic or chronic)	Medium	Medium
Sea level rise	Medium	Medium
Great Lakes level fluctuation	N/A	N/A
Subsidence	Medium	Medium
Geological hazards (including earthquakes and tsunamis)	Low	Low
Other: Shoreline Hardening	Medium	

2. If the level of risk or state of knowledge about any of these hazards has changed since the last assessment, please explain. Also, identify any ongoing or planned efforts to develop quantitative measures for this issue area.

When Hurricane Isabel made landfall in Virginia in 2003 it was only a Category 1 storm, but still managed to cause 36 deaths and $625 million in damages to residential, commercial, industrial, and government structures. Tropical Depression Gaston (2004) and Tropical Storm Jeanne (2004) also caused major damage to property and roadways on Virginia's coast and were declared federal disasters. The destruction caused by these storms displays both the level of risk and the need for improved public awareness and education about damage prevention.

Although Sea Level Rise has not contributed to any documented risk in the past, there is a growing concern about its impact on shoreline management. Researchers at USGS have estimated relative sea level rise along the mid-Atlantic coast at 4 millimeters per year. However, wetland accretion rates are estimated at only 2 millimeters per year. The long-term result could be vast submergence of coastal wetlands. Coupled with both episodic and chronic shoreline

erosion, this could become an even greater problem. While research is being conducted at the Virginia Institute for Marine Science (VIMS) on the potential impact of this combination, a management strategy has yet to be developed to address it.

Another concern related to sea level rise is risk associated with storm surge. A recent study by VIMS has shown that sea level rise accentuates the risk due to storm surge during hurricanes and other major coastal storms. The study concludes that storm flood risk assessments need to able to be adjusted for most recent sea level trends.

There is a growing concern about the effect shoreline hardening to protect property from erosion will have on the natural shoreline. The VIMS *Virginia Wetlands Report,* Spring '05 issue, explains trends in shoreline hardening and the impacts of shoreline management in its Annual Summary article. Virginia issued permits to harden 229 miles of shoreline between 1993 and 2004 and that rate continues at 15 to 20 miles per year. These structures often have significant impacts to tidal wetlands, riparian areas, and fisheries habitat.

3. Summarize the risks from inappropriate development in the state, e.g., life and property at risk, publicly funded infrastructure at risk, resources at risk.

A consensus definition of or set of criteria for inappropriate development in Virginia's coastal zone has not been developed to date. However, coastal localities have different resources, geography, and population densities, so what constitutes inappropriate development in one place may not in another. For this reason, inappropriate development should be defined by each coastal locality in order to preserve the vital resources in their area. The following risks should be considered when identifying inappropriate development in Virginia's coastal zone:

- Damage or loss of habitat of migratory birds, particularly on the Eastern Shore, which has been documented as a critical migratory corridor for a wide variety of birds.
- Loss of cultural or natural heritage of highly undeveloped areas
- Destruction of vegetation on coastal primary sand dunes and beaches
- Increased erosion, flooding, property damage and loss of life during severe storm events
- Alteration of natural contours that act as buffers during storm events
- Decreased water quality from increased stormwater runoff, which also impairs habitat for marine animals and plants, such as oysters and SAV.

Management Characterization

1. Indicate significant changes to the State's hazards protection programs since the last assessment:

Mechanism	*Changes 2000-2005*	*Changes 1997-2000*
Building setbacks/restrictions	Moderate	None
Methodologies for determining setbacks	None	**
Repair/rebuilding restrictions	None	None
Restriction of hard shoreline protection structures	Moderate	Moderate

Promotion of alternative shoreline stabilization methodologies	Moderate	**
Renovation of shoreline protection structures	Moderate	None
Beach/dune protection	Significant	Moderate
Permit compliance	None	None
Inlet management plans	None	None
SAMPs	None	None
Local hazards mitigation planning	Moderate	None
Local post-disaster redevelopment plans	Moderate	**
Real estate sales disclosure requirements	None	**
Restrictions on publicly funded infrastructure	None	None
Public education and outreach	Moderate	Moderate
Mapping/GIS/tracking of hazard areas	Significant	**

** Mechanisms not included in the last Section 309 Assessment

2. For categories with changes:
- ***Summarize the change***
- ***Specify whether it was a 309 or other CZM driven change and specify funding source***
- ***Characterize the effect of the changes in terms of both program outputs and outcomes***

Building Setbacks/Restrictions
The Virginia Uniform Statewide Building Code (USBC), updated in 2003, is based on the 2000 model building codes developed by the International Code Council, Inc. These new codes have more stringent fire and wind provisions.

Restriction of Hard Shoreline Structures, Promotion of Alternative Shoreline Stabilization Methodologies, Renovation of Shoreline Protection Structures
As a result of a grant from the Coastal Program, in May 2005, VIMS published the *Interagency Shoreline Management Consensus Document* providing guidance to various state agencies as well as local government for setting priorities for shoreline management in Virginia. The priorities, developed through collaboration with various state agencies, call for minimizing environmental impacts while still providing erosion control. The four general approaches, from least to greatest impact, are 1) no action, 2) non-structural techniques, 3) combined non-structural and structural techniques, and 4) structural techniques. The document aims to convey best available technical advice on shoreline structures for interested property owners and provides specific case study examples illustrating how impacts to the environment can be minimized. Local and state governments are recommended to actively identify areas that are ideal for no action to be taken. The priorities set in this consensus document will be reflected in the review of habitat management permits for development that affects tidal wetlands, coastal primary sand dunes, and subaqueous lands.

Beach/Dune Protection

The 2001 Coastal Needs Strategy focused on enhancing dune management and supported research to support amendments to the Coastal Primary Sand Dune Protection Act of 1980. The proposed changes are:

- Alternative jurisdictional definitions that would more accurately describe and delineate the functional limits of natural dune systems, as opposed to just primary coastal dunes.
- Expansion of the reach of the regulatory program to existing resources in current non-jurisdictional localities.
- Inclusion of beaches and their supporting dune systems.
- Changes to the definition of a resource protection features under the Chesapeake Bay Preservation Act and Regulations.

Several studies have been commissioned through Section 309 funds to support these goals. The VIMS studies, *Chesapeake Bay Dune Systems: Evolution & Status* and *Chesapeake Bay Dune Systems: Monitoring Years 1-4,* located, classified, and enumerated the existing jurisdictional dunes and dune fields of the Chesapeake Bay both inside and outside of the localities identified in the Dune Act. (The localities listed in the Dune Act are the counties of Accomack, Lancaster, Mathews, Northampton, and Northumberland, and the cities of Hampton, Norfolk, and Virginia Beach. Dunes within one of these localities are jurisdictional dunes.) The studies found 365 potential jurisdictional dune sites, of which 219 sites were determined to have primary sand dunes under the current definition. An additional 30 dune sites were counted in non-jurisdictional areas. The studies' recommendations pertinent to Section 309 goals are that the state should: 1) amend the state definition of a dune to be more consistent with Virginia's coastal geology, 2) expand the jurisdiction of the Dune Act to include other localities with coastal dune fields, 3) establish Resource Protection Areas (RPAs) around beaches and dunes to eliminate overlapping regulatory authority, and 4) emphasize dune and beach restoration/creation to protect from shoreline erosion. As a part of the monitoring study, VIMS also analyzed created dunes as a component of shoreline management and found that there was significant value to creating secondary dunes and dune fields as a part of coastal hazard protection.

Local Hazards Mitigation Planning & Local Post-Disaster Redevelopment Plans

As part of the federal Disaster Mitigation Act of 2000, localities desiring federal dollars for hazards mitigation are required to develop local hazard mitigation plans. Beginning in 2003, the state asked the 23 planning district commissions (PDCs) in the state to manage the development of local hazard mitigation plans. The Federal Emergency Management Agency (FEMA) provides funding to the Virginia Department of Emergency Management (VDEM) which, in turn, provides funding to local PDCs. The federal approval process for these 23 plans is ongoing. Once a plan is approved federally, each locality in the district reviews the plan for approval. This plan development allows localities to determine risks, prioritize hazard mitigation efforts, and continue to receive federal funds. Furthermore, FEMA knows that localities are preparing for disasters and will at least be partially prepared for the redevelopment effort to follow.

Public Education and Outreach

Through a grant from the coastal program, VIMS reprinted the popular brochure, *Shoreline Erosion Problems? Think Green!* The brochure outlines alternative shoreline protection that does not require building hard structures.

The Virginia Department of Emergency Management (VDEM) staff distributes information and provides workshops and training sessions at local hardware and home building supply stores. Workshops about coastal hazards are focused on being proactive in preventing damage. Hurricane preparedness and basement flood-proofing are typical workshop topics. This outreach strategy allows homeowners and renters access to VDEM experts during their decision-making process.

Community education for coastal hazards in floodplain management encompasses many efforts. To minimize the potential for flood damage in coastal areas, the Department of Conservation and Recreation (DCR) responds to individuals requesting assistance and understanding of floodplain regulations. Since the last assessment, the number of requests for information has decreased. During the course of a year, DCR's Floodplain Management Program staff typically: responds to over 300 technical assistance requests; conducts and participates in at least 8 training sessions, workshops, and conferences on floodplain management; and conducts 60-80 community assistance visits. Requests for community education have remained in demand due to Hurricane Floyd in 1999, and Hurricane Isabel in 2003.

Permit reviews by Floodplain Management Program staff are largely the same as reported in the last assessment. The Floodplain Management Program reviews applications under the 401/404 joint permit application process, VDOT's State Environmental Review Process (SERP) and community development block grant programs. Reviews are conducted to ensure compliance with existing regulations and to ensure that modifications to structures and/or stream channels do not reduce the flow capacity of channels and lead to increased flooding. The Floodplain Management staff conducts over 250 reviews annually. In addition, in response to extensive levels of flooding in recent years, DCR's floodplain staff worked intensively with FEMA and other federal and state agencies to support response and recovery efforts. This work included community education efforts in several of Virginia's Tidewater communities that received Presidential disaster declarations.

Mapping/GIS/tracking of Hazard Areas

Since the last assessment FEMA has instituted a mapping conversion effort (map modernization) to convert older flood maps into a newer GIS- based format. In limited cases, additional detailed flood study work is being done by DCR to update the older flood maps. Funding to update the maps comes through FEMA. At this time, access to digital maps is limited to localities that can technically support the GIS format.

The most immediate result of the change is an enhanced GIS-based digital version of the flood maps that allows communities to better manage identified floodplains. While this digitized resource is beneficial, there is a continuing need to conduct detailed flood studies. This is particularly relevant in rural communities where increased development pressures are occurring in areas where base flood elevations have been determined by an approximation method rather than by actual field survey.

3. Discuss significant impediments to meeting the 309 programmatic objectives (e.g., lack of data, lack of technology, lack of funding, legally indefensible, inadequate policies, etc.)

Until the proposed changes to the Coastal Primary Sand Dune Act are implemented, there will continue to be a gap in the state's ability to manage valuable dune and beach resources in localities not currently covered by the Act. These features serve to protect against coastal hazards such as shoreline erosion and flooding. Furthermore, without regulatory or policy changes, hard structures will continue to be used as the most popular shoreline erosion control mechanisms, despite their damage to natural habitat. Improved outreach to waterfront property owners, training for local wetlands boards, and regulatory incentives should also increase the use of more appropriate shoreline management measures.

The lack of accurate, current information on shoreline erosion remains another significant impediment to meeting 309 objectives. There is a need to better understand the degree to which this condition (i.e. shoreline erosion) persists and is problematic within the coastal zone. There are no regional studies that report shoreline erosion or accretion trends in Virginia after 1983. Related to shoreline erosion, there is also a lack of information on the effect of sea level rise on coastal development *and* marshes.

Another major impediment is the ability to acquire land for shoreline protection. Coastal land values continue to rise, making public acquisition of easements, purchase of development rights, or other acquisition increasingly difficult.

Conclusion

1. **Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy. (***See impediments above*)

To overcome the impediment noted above, one recommendation is to implement the proposed changes to the Coastal Primary Sand Dune and Beaches Act after the VIMS Non-jurisdictional Beach Assessment is completed.

One major gap is the lack of readily available public outreach information after a major storm. People need to know exactly where to seek assistance with debris removal, flooding information, or redevelopment. To address this gap, better communication is needed between federal, state, and local governments. One possibility could be funding for localities to create "twenty most-asked questions after a natural disaster" pamphlets. The pamphlets would provide information about the initial steps to take to remedy post-hazard issues as well as appropriate contact information for local, state and federal assistance. Related to this, small businesses are significantly threatened by coastal hazards. Guidance for coastal communities on post hazard/disaster economic assistance to small businesses to avoid major economic shutdowns and dislocations is another public outreach need.

Capturing the public's attention is also an essential need in hazard mitigation. From education about the detrimental aspects of coastal development to retrofits of personal property, there needs to be a better coordination between state agencies to develop engaging public campaigns to inform the public. Specifically, the Coastal Program could be instrumental in ensuring

coordination among agencies and public education about the recommendations contained in the *Interagency Shoreline Management Consensus Document.*

A gap that could be filled by the Coastal Program would be to fund regional studies on shoreline erosion and accretion trends, as well as the effect of sea level rise on coastal development *and* marshes. More specifically, the Shoreline Inventory should be updated, shoreline evolution studies conducted, and shoreline management techniques identified and assessed. Related to this is the need for detailed flood studies, particularly in rural communities where increased development pressures are occurring in areas where base flood elevations have been determined by an approximation method rather than by actual field survey.

Another recommended study would aim to present the argument for implementing "living shoreline" practices for minimizing shoreline damage. This study should aim to increase public understanding of the role of natural resources in mitigating coastal hazards, such as the role of wetlands in reducing storm surges, and should lead to specific policies that would support the use of natural resources to reduce coastal hazards. More specifically, this study would present the General Assembly with the need for broader enabling legislation for alternatives to shoreline hardening that help reduce coastal hazards.

Another gap that might be filled by the Coastal Program is in assisting localities in acquiring the technology needed for the new GIS-based flood maps so that they can use this resource to identify floodplains. The Coastal Program could also help localities to define and develop programs to prevent inappropriate development as it relates to their geography.

Lastly, for the priority of acquiring sensitive land for shoreline protection, the Coastal Program may wish to consider how it can best leverage funding to assist in public land acquisition as well as private land conservation efforts by organizations such as The Nature Conservancy.

2. What priority was this area previously and what priority is it now for developing a 309 strategy and designating 309 funding and why?

1997 Assessment	2000 Assessment	This Assessment
High ___	**High _✓**	**High _✓**
Medium _✓_	Medium ___	Medium ___
Low ___	Low ___	Low ___

The destruction caused to Virginia coastal communities by Hurricane Isabel in 2003 as well as the unimaginable tragedy of Hurricane Katrina has brought awareness of coastal hazards into the forefront of the minds of Virginians. The Coastal Policy Team recognizes the importance of following through on the proposed changes to the Coastal Primary Sand Dune Act that came out of the previous Section 309 Assessment as well as to perform storm surge modeling and implement changes to shoreline management practices to protect against the these storms.

Ocean Resources

Section 309 Programmatic Objectives

I. Develop and enhance regulatory, planning, and intra-governmental coordination mechanisms to provide meaningful state participation in ocean and Great Lakes resource management and decision-making processes.

II. Where necessary and appropriate, develop a comprehensive ocean and Great Lakes resource management plan that provides for the balanced use and development of ocean and Great Lakes resources, coordination of existing authorities, and minimization of use conflicts. These plans should consider, where appropriate, the effects of activities and uses on threatened and endangered species and their critical habitats. The designation of specific marine protected areas should be considered.

Resource Characterization

1. In the table below characterize ocean and/or Great Lakes resources and uses of state concern, and specify existing and future threats or use conflicts.

Resource or Use	Current Threat or Conflict	Degree of Threat (High/Medium/Low)	Anticipated Threat or Conflict in the Future
Fisheries	Trawl survey funding uncertain; decline of Black Sea Bass, Menhaden, American Shad, Blue Crab and Horseshoe Crab	Medium	Uncertainty in loss of funding for Juvenile Trawl Survey and CHESMAP; rise in tidal/coastal development
Oil & Gas	Implications from State-ordered study on offshore natural gas exploration and leasing and associated resource impacts	Low	Potential withdrawal of moratorium on oil and gas exploration; increase in demand for domestic oil
Sand	Lack of clear alternatives to offshore borrowing from Sandbridge Shoal; mining and loss of benthic habitats	Medium	Increasing demand for beach sand (renourishment)

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

Fisheries
Trawl Survey: The Virginia Institute of Marine Science (VIMS) continues to manage the Juvenile Trawl Survey in the Chesapeake Bay to assess population shifts in fin- and shell-fish

stock, though the Institute believes that an expanded monitoring system is needed to provide managers and policy analysts with complete data sets for multi-species and ecosystem management strategies. Waterfront residential and commercial development in the Bay may be reducing habitat for populations under survey by VIMS. Funding sources for the Juvenile Trawl Survey still remain a concern from the last assessment in 2000. Recreational fishing license fees from the Virginia Recreational Fishing Department supported the survey in 2002 and 2003. Since 2003, the NOAA Chesapeake Bay Office has funded the survey. For 2005, VIMS has requested funding from NOAA but there is no assurance the survey will be funded. This proposal is being submitted to the Virginia Fisheries Advisory Board to request emergency funding to continue this critically important finfish and blue crab monitoring program for an additional year.

In addition to the Juvenile Survey, VIMS also conducts a survey of adult fish populations in the Chesapeake Bay called CHESMAP. Initiated in 2002 from an overwhelming response to administrative call for adult fisheries data, CHESMAP conducts approximately 80 trawl tows annually throughout the entire mainstem of the Bay to estimate the population age structure and diet composition of adult fish populations to create multi-species assessment models. CHESMAP is one of the first attempts nationally to create an ecosystem-based fisheries management assessment to support sustainable fisheries management. Data from CHESMAP will provide important information on predator-prey relationships and population estimates in the Chesapeake Bay as they relate to environmental factors such as salinity, temperature, habitat composition, etc. The National Oceanographic and Atmospheric Administration (NOAA) currently provides the majority of funding for CHESMAP, though support also comes from the sale of recreational fishing equipment through the Virginia Marine Resources Commission. Since NOAA funding is intended, for both surveys mentioned, to be mainly activating, state program funding is sought for long-term continuation of the surveys.

Menhaden: Menhaden are extremely important as a forage fish for top predator fish such as striped bass, bluefish and weakfish. They also play an important role as a filter feeder, helping to control the growing sedimentation of the Bay, which is believed to affect SAV growth. According to the Atlantic States Marine Fisheries Commission (ASMFC), "the issue of possible local depletion of menhaden in the Bay is at the top of the list for accelerated research and management actions to address this specific concern." Consequently, a decision in August 2005 by the ASMFC imposed an annual 105,800 metric ton limit on menhaden harvesting from Chesapeake Bay for five years beginning in 2006. This cap is based on the average industry harvest for the previous five years. The decision also calls for a research program to assess the status of menhaden in the Bay. The program's goal is to determine menhaden populations in the bay, study the movement of menhaden between the bay and estuaries, and estimate the level of predation on menhaden. For the state to implement the cap on menhaden, the General Assembly must enact the legislation. If the General Assembly does not act, the U.S. Secretary of Commerce has the option to decide whether Virginia is being non-compliant or if ASMFC has exceeded its mandate.

Blue Crabs: Harvest counts in 2002 showed a small improvement in the population of blue crab, though still below critical levels. A Blue Crab Migratory Corridor Sanctuary was established in 2000 through a recommendation of the Bi-State Blue Crab Advisory Committee, in collaboration

between Virginia and Maryland fisheries departments and the Chesapeake Bay Commission. The Advisory Committee closed in 2003 for lack of funding from the state of Virginia, though the sanctuary continues to protect female blue crabs migrating to spawning grounds in the lower Chesapeake Bay as crabs beyond the boundaries typically show a four to seven fold increase in mortality rates. Furthermore, a blue crab reintroduction program through VIMS is attempting to establish a sustainable population in the Chesapeake Bay area from hatchery-grown crabs.

American Shad: A total moratorium on the harvesting of Shad in the Chesapeake Bay was re-adopted and in effect through 2004 (VMRC Reg. 4 VAC 20-530-10 ET SEQ.). The intent of the moratorium is to reduce fishing mortality in order to rebuild the Virginia stocks of American Shad and to comply with the requirements for ocean-intercept commercial fisheries, as specified by the Interstate Fishery Management Plan for Shad and River Herring.

Black Sea Bass: This is primarily a trap fishery along the seaside of Virginia's Eastern Shore and Virginia Beach coastline down to North Carolina. Stocks of Black Sea Bass are believed to be in decline. Changes in trap design are mandated by Virginia Marine Resources Council (VMRC) to reduce taking of undersized fish and allow for greater breeding of this species. On April 5, 2005, VMRC Regulation 4 VAC 20-950-10 ET SEQ established an annual size limits, gear restrictions, and quotas on the harvest of Black Sea Bass.

Sea Scallops: Research on impacts of gear modifications and a rotational closure management strategy have significantly improved the outlook for the sea scallop fishery in the U.S. – one of the most lucrative sectors of commercial fishing in both the nation and the Commonwealth of Virginia.

Sea Turtles: Gear changes to scallop dredge vessels are under research by the Virginia Institute for Marine Science Sea Turtle Stranding Program to reduce fatalities of sea turtles. Information cards explaining resuscitation techniques and modified gear rigging are aboard some 150 commercial vessels operating along the Atlantic Coast.

Whelk and Horseshoe Crab: As the bait of choice for channeled whelks, horseshoe crab stocks are believed to be in decline from the emerging channeled whelk fishery in Virginia. Efforts are underway to evaluate alternative bait for the whelk and reduce general demand for horseshoe crabs.

Oysters: Aquatic oyster reefs are being reintroduced as part of the Chesapeake 2000 agreement committing to, "by 2010, achieve, at a minimum, a tenfold increase in native oysters in the Chesapeake Bay." The commitment is joined by cooperation among multiple agencies including state, federal, and non-profit and academic entities. Also, VIMS seeks to address this concern with research on native oyster growth in the Great Wicomico River. A central piece of the VIMS research efforts is development of selectively bred, disease-tolerant strains of local oysters for "seeding" of newly constructed reefs, an effort funded in large part by competitive grant funds from the National Oceanic and Atmospheric Administrations Oyster Disease Research Program

Research focused on augmenting oyster fishery production in Virginia and Maryland has also shown that an Asian hatchery variety, *C. ariakensis*, is faster growing and better at tolerating

diseases such as MSX and Dermo, though there is concern on introducing non-native species to Bay ecosystems. For more information on *C. ariakensis,* please see the "Aquaculture" section.

Submerged Aquatic Vegetation (SAV): Numerous federal, state and local programs have worked to reintroduce, restore, and protect SAV throughout the Chesapeake Bay since its record decline in the 1960s and 70s. A VIMS survey in 2003 found a 30% decline in SAV coverage from the previous year, though this decline was largely attributed to Hurricane Isabel that same year, which altered the salinity and turbidity of the Bay enough to dramatically reduce SAV populations. A VIMS survey in 2004 showed that SAV increased in two (Upper and Middle) and decreased in one (Lower) geographic zones delineated for Chesapeake Bay. Increases in the upper zone were primarily due to large increases in beds near the Susquehanna Flats due to high runoff keeping salinity at optimal levels for growth of SAV in this region; however, this same high runoff may have contributed to decreases in the lower bay due to increased turbidity levels limiting light.

Often changes in SAV population cannot easily be attributed to single causes or events due to the complexity of the Bay environment. However, several human-related effects are of concern for the health of SAV including watershed specific storm water runoff leading to decreased salinity in the Bay and clam dredging as destructive to SAV growth. As of this report, prohibition of clam dredging in the Chincoteague Bay Submerged Aquatic Vegetation Sanctuary is having positive effects on SAV habitat. Continuing their goal from the Section 309 2000 Assessment, VIMS is working to achieve 185,000 acres of SAV, bay-wide, by the year 2010 with annual reporting and a reevaluation of progress in 2008.

Oil and Gas

A 2002 reassessment by the Mineral Management Service (MMS) in the Department of Interior recommended an extension on the moratorium for oil and gas exploration on the entire Outer Continental Shelf through June 2012. However, the 2005 Virginia General Assembly has ordered a study of natural gas exploration and leasing on the extent of the resource, federal and state environmental permitting and review (including Coastal Zone Management Act consistency review), and potential impacts on tourism and coastal and natural resources. The study is to be completed by January 2006 and is expected to enhance the state's ability to address the siting of offshore energy facilities and anticipate their impacts.

The 2005 Energy Policy Act will encourage increased domestic production of oil and natural gas, grant the MMS new authority for federal offshore alternate energy uses, and require a comprehensive inventory of oil and gas resources on the Outer Continental Shelf using existing data and inventory sources. Ocean resources are not currently impacted by offshore natural gas drilling as the moratorium remains in effect, though with recent activity pushing for exploration impacts and feasibility of drilling, the continuation of the moratorium is in question. (For more information on Oil and Gas issues, see the "Energy and Government Facility Siting" section.)

Sand

Virginia Department of Mines, Minerals and Energy (DMME) manages beach renourishment projects. Advisory support for renourishment projects has changed from the Virginia Institute of Marine Science to the Division of Mineral Resources within DMME, though there are no

anticipated future changes in project management. Sandbridge Shoal continues to supply beach renourishment material for the town of Virginia Beach and adjacent military installation at Dam Neck. However, Sandbridge Shoal is only expected to supply a limited amount of additional material before alternative sites must be located. To date, no comprehensive analysis for alternative sources of offshore sand for Virginia Beach has been conducted. However, there is some low-level funding from the Minerals Management Service for renourishment and alternative exploration projects. Other sources of sand may be found in the Bay area, as exemplified by the cities of Hampton and Norfolk which have beach nourishment programs using sources of sand in the Bay other than Sandbridge. The City of Hampton has been using sand from Horseshoe Shoal for their re-nourishment programs, while sand for Norfolk projects have generally come from dredging within the Bay. Smaller re-nourishment projects have also recently occurred in Charles City and Newport News.

Funding for monitoring these re-nourishment efforts are currently inadequate to assess the resource impacts from all dredging and renourishment projects on the Virginia coastline. For example, it is still unclear at this time if offshore sand resources are negatively affected from sand mining activities. Comprehensive monitoring is recommended to assess potential for sand bar effects and swings in the current flow.

Management Characterization

1. Identify significant state ocean and/or Great Lakes management programs and initiatives developed since the last assessment:

Program	Program Status	Funding Source (309 or Other)
Statewide comprehensive ocean management statute	No	
Statewide comprehensive ocean management plan	No	
Single purpose statutes related to ocean resources	Yes	American Shad Moratorium extension
Statewide ocean resources planning/working groups	No	
Regional ocean resources planning efforts	Yes	Fisheries Ecosystem Plan; Virginia Seaside Heritage Program
Ocean resources mapping or information system	Yes	Blue Green Infrastructure Mapping Initiative
Dredged material management planning	No	
Habitat research, assessment, monitoring	Yes	Renewed SAV research; Great Wicomico Study
Public education and outreach efforts	Yes	Eco-tour guide certification

		class

2. For changes identified above, briefly summarize the changes and their effects

Single purpose statutes related to ocean resources
American Shad Moratorium – Virginia Statute 4 VAC 20-530-10 et seq. was amended and re-adopted on January 1, 2003 to reduce fishing mortality in order to rebuild the Virginia stocks of American Shad and to comply with the requirements for ocean intercept commercial fisheries, as specified by the Interstate Fishery Management Plan for Shad and River Herring.

Regional ocean resources planning efforts
Virginia Seaside Heritage Program (VSHP) – Initiated and funded by the Virginia Coastal Program in 2002, the VSHP is a public-private venture to address management of the aquatic resources of the barrier islands, bays, and salt marshes along Virginia's Eastern Shore. Program partners administer funding for restoration and monitoring projects aimed at gaining knowledge of ocean resources and improving coastal habitat health.

Fisheries Ecosystem Plan (FEP) - A multi-stakeholder assessment and recommendation plan for improving Chesapeake Bay fisheries management. The FEP describes the structure and function of the Chesapeake Bay ecosystem, including key habitats and species interactions. The FEP seeks to serve as an umbrella document to support ecosystem-based approaches in individual Fishery Management Plans. It will include recommended actions to implement ecosystem-based approaches to fisheries management for Bay-resident and coastal species and it will recommend specific research to enhance knowledge of the ecosystem and its fisheries to support long-term management objectives. Working groups leading up to the formation of the FEP were organized in large part from recommendations from the 2000 Section 309 Coastal Needs Assessment.

Ocean resources mapping or information system
Blue Green Infrastructure Mapping Initiative (BGIMI) – Supported by previous Section 309 funding, this mapping initiative seeks to create productive communications among agencies and between levels of government to better accomplish the integration of local land use decisions with state water use decisions. The intent of this project is to develop data layers that meet individual agency needs for coastal resource management and also support the Coastal Program's efforts to create a web accessible mapping system for coastal resource data.

Habitat research, assessment, monitoring
Submerged Aquatic Vegetation (SAV) Habitat Restoration – Undertaken through the Virginia Seaside Heritage Program, SAV restoration is important for water quality and fin- and shell-fish habitat. The Heritage Program provides one of several restoration projects, underway in the Chesapeake Bay and seaside areas. SAV restoration is a multiyear program supported in concert from NOAA, the Army Corp., and the Keith Campbell Foundation and focuses mainly on eelgrass, an important habitat for bay scallops and a threatened resource in the Chesapeake Bay. Initial efforts to reintroduce plots of eelgrass have proven successful as the growth and habitat characteristics are continuing to be monitored. Continual monitoring of SAV restored habitat also shows positive results from areas off-limits to commercial and recreational clam dredging.

Public education and outreach efforts
Eco-tour Guide Certification Class – Created under Virginia Coastal Program's Seaside Heritage Program in 2002, state certification of eco-tour kayak and boating operators includes barrier island natural history and geology and information on approaching marine wildlife, endangered and keystone species of the Eastern Shore, and human impact, both past and present. Successful participants may display eco-tour decals indicating they are safe and knowledge tour operators in the coastal environment.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

Extensive monitoring and habitat restoration has occurred since the previous assessment in 2000, largely attributed to assistance from the Virginia Coastal Program's Seaside Heritage Program. There is still an expressed need for regional comprehensive fisheries management plans for both bay and coastal fisheries able to address multiple species across variable habitat types. The Fisheries Ecosystem Plan promises to be an important step toward long-term management efforts involving both public and private stakeholders and emphasizing ecosystem-based approaches in individual Fisheries Management Plans. In addition, related to the need for fisheries management plans, it is important to note that while NOAA has ecosystem and multi-species modeling for Chesapeake Bay fish, there is still a need for extending these modeling efforts to coastal fish and promote regional participation.

As pressure increases for finding new energy sources in Virginia, the issue of offshore exploration for natural gas and oil may become a more prominent issue and threat to Virginia's coastal resources. (See the "Energy" section for more details on potential priorities and gaps.) It is worth noting that new and emerging technologies may render renewable energy sources such as ocean waves and tidal currents an important resource for energy generation.

Finally, as beach renourishment efforts continue, there will be a need for additional sources of sand (other than Sandbridge Shoal) making it important to increase monitoring activities in these areas to assess the impacts of continuous dredging and renourishment activities.

2. What priority was this area previously and what priority is it now for developing a 309 strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	___	High	___	High	___
Medium	___	**Medium**	_✓_	**Medium**	_✓_
Low	_✓_	Low	___	Low	___

This ranking was based on the Coastal Policy Team's recognition that fisheries ecosystem management plans are a valuable tool that need to be developed for all bay and coastal fisheries.

Wetlands

Section 309 Programmatic Objectives

I. Protect and preserve existing levels of wetlands, as measured by acreage and functions, from direct, indirect and cumulative adverse impacts, by developing or improving regulatory programs.

II. Increase acres and associated functions (e.g., fish and wildlife habitat, water quality protection, flood protection) of restored wetlands, including restoration and monitoring of habitat for threatened and endangered species.

III. Utilize non-regulatory and innovative techniques to provide for the protection, restoration, and acquisition of coastal wetlands.

IV. Develop and improve wetlands creation programs.

Resource Characterization

1. Extent of coastal wetlands

TABLE 1

Wetlands Type	**Extent (acres & year of data)**	**Trends (± acres/year)**			
Tidal [12]		**2001**	**2002**	**2003**	**2004**
Vegetated: Non-vegetated:[13]	222,368 (VIMS) 116,210 (NWI)	-4.9 -33.4	-6.1 -69.0	-24.9 -112.5	-5.0 -33.9
Non-Tidal/Freshwater[14]	909,097 (NWI)	-191.2	-178.5	NA	NA
Publicly Acquired Wetlands	No new information				
Restored Wetlands	See #2 below				
Created Wetlands	See #2 below				
Other					

[12] Vegetated tidal wetlands totals came from the VIMS Tidal Marsh Inventory, 2002. This inventory was a compilation of VIMS data gathered in the 1980s and used data taken by people on the ground that knew the Virginia coast. The previous assessment used remote data from the National Wetlands Inventory (NWI), which was done using remote data. This difference is the probable cause of the significant discrepancy in assessments. Non-vegetated came from NWI from the 1980s and 1990s. The trends data came from queries at this VIMS website: http://ccrm.vims.edu/wetlands/copyright.html.

[13] Virginia includes intertidal mudflats and beaches as non-vegetated tidal wetlands.

[14] This number is for Non-tidal Wetlands only, taken from the NWI. Data for freshwater wetlands specifically was not available. The trends data came from data queries at http://www.vims.edu/rmap/wetlands/cgi-bin/nontidal.html.

2. If information is not available to fill in the above table, provide a qualitative description of wetlands status and trends based on the best available information. Also, identify any ongoing or planned efforts to develop quantitative measures for this issue area. Provide explanation for trends.

There are several restoration and creation programs throughout the state for both tidal and non-tidal wetlands. However, comprehensive data concerning the numbers and functions of the various created and restored wetlands has been difficult to acquire. The Virginia Department of Environmental Quality (DEQ) and the Virginia Marine Resources Commission (VMRC) report that wetland restoration and creation have served to offset *permitted* non-tidal wetland losses. However, losses due to *unregulated* activities are the main contributor to the net loss of wetlands in Virginia. Below, several of the state wetlands restoration and creation programs are listed.

Several private and public sector groups are working to restore wetlands in Virginia. The Elizabeth River Project (ERP) has been involved with and worked with the cities of Chesapeake and Norfolk on small tidal wetland restoration projects. Also, through ERP's River Stars Program, several businesses along the river have funded their own wetland restoration projects on site. These projects are small; usually far less than one acre and total numbers of acres are not known. Furthermore, the Navy has been restoring tidal wetlands as a part of Superfund at a rate of about one acre per year. Lastly, the Department of Game and Inland Fisheries (DGIF) and the Department of Conservation and Recreation (DCR) continue efforts to restore non-tidal wetlands, despite limited resources.

3. Characterize direct and indirect threats to coastal wetlands, both natural and man-made. For threats identified, provide the following information: scope of threat, recent trends, and impediments to addressing the threat.

TABLE 2

Threat	2005 (Current) Significance High/Medium/Low	2000 Significance
Development/fill impacts	High	High
Alteration of hydrology	Low	Not evaluated
Erosion	Medium	Medium
Pollution	Low/Medium	Low
Channelization	Low	Low
Nuisance or exotic species	Medium	Medium
Freshwater Input	Low	Low
Sea level rise	High	Not evaluated
Other:		

Development/fill: This is the greatest identified threat to both tidal and non-tidal wetlands in Virginia; however the new "no net loss" tidal wetlands policy (*described below*) requires wetlands lost due to development to be mitigated.

The fear of erosion and the real or perceived threat of flooding are reported to be most common cause of wetland fill. In fact, the largest threat to tidal vegetated wetlands is shoreline hardening, including riprap and bulkheads, installed by both developers and homeowners to prevent erosion. Over 220 miles of hard shoreline structures were permitted between 1993 and 2004. Commercial structures, such as agricultural, commercial, industrial, and community piers, marinas, are reported to have the second greatest impact on tidal vegetated wetlands.

The largest threats to non-vegetated wetlands occur as a result of efforts to protect against erosion. The most common of these efforts are beach nourishment, bulkhead toe protection, and maintenance dredging. Local governments are the main developers of these types of projects, usually to preserve and restore public beaches. To a lesser extent, private breakwater systems also have an impact.

Erosion: This is an unquantified threat. In terms of non-tidal wetlands, erosion from stormwater run-off increases sediment levels and is considered a significant problem.

Pollution: Sources of pollution are available through the Total Maximum Daily Load (TMDL) program in which impaired waters have been identified. However, there is no easy systematic way of collecting information on the types or extent of the nonpoint pollutants from different sources, such as homeowners and agriculture. With emerging technologies for DNA tracking, identification of sources over the years may become more routine and accessible to state and local governments. There is also the need to account for the contribution of wetlands to background dissolved oxygen and fecal coliform.

Nuisance or exotic species: *Phragmites australis* continues to be an important threat to tidal wetlands. It is choking out native wetlands species and does not provide the same habitat functions as the native species it is replacing. Although several *Phragmites* control efforts have been undertaken, a comprehensive program to restore native vegetation to wetlands invaded by *Phragmites* has yet to be developed.

Purple loosestrife is a threat to both tidal and non-tidal wetlands. Of little or no value to wildlife, purple loosestrife has been found to crowd out native wetland species that provide food and shelter to native wildlife. Mute swans are an exotic species of swan that competes with Virginia's native waterfowl for food and habitat. More studies should be done to understand the extent of these threats.

Sea level rise: Two issues associated with sea level rise cause threats to tidal wetlands. First, the methods commonly used to protect shorelines against erosion reduce the amount of sediment available in the littoral system for marshes to trap and keep pace with historic sea level rise; consequently, current rates of sea level rise appear to be out-pacing the capacity of some wetland communities to maintain appropriate elevations. Second, where shorelines are hardened wetlands cannot shift inland as the sea level rises, so wetlands are lost as they convert to subaqueous land.

Management Characterization

1. Within each of the management categories below, identify significant changes since the last assessment:

Management Category	Changes since last assessment
Regulatory Programs	Significant
Wetlands protection policies and standards	Significant
Impact analysis	Moderate
Restoration/enhancement programs	Moderate
Special Area Management Plans	Moderate
Education/outreach	Moderate
Wetlands creation programs	Minor
Mitigation banking	Minor
Mapping/GIS/tracking systems	Moderate
Acquisition programs	None
Other	

2. For categories with changes provide the following information for each change:

- **Characterize the scope of the change**
- **Describe recent trends**
- **Identify impediments to addressing the change**

Regulatory Programs

In previous reporting periods, the Virginia Water Protection Permit Program (VWPP) served as the mechanism whereby the Department of Environmental Quality and Virginia Water Control Board could review impoundments and water withdrawals to protect instream flows. It also was the mechanism for providing the state water quality certification under Section 401 of the Federal Clean Water Act for activities affecting both tidal and nontidal wetlands subject to permitting by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 U.S.C. 1344).

In 2000 the General Assembly enacted legislation amending the VWPP Program. The amendments continue the VWPP as the vehicle for 401 certification, but resolve jurisdictional issues by requiring a VWPP for (1) excavation in wetlands, and (2) other activities affecting wetlands, including nontidal wetlands (draining, filling or dumping, permanent flooding or impounding, or new activities that cause significant alteration or degradation of existing wetlands acreage or function). In sum, the amendment confirms Virginia's jurisdiction over activities and wetlands that the DEQ had been regulating prior to 2000, but removes the program's dependency on USACE jurisdiction under the federal Clean Water Act. Prior to the amendments, applicants seeking a Section 404 permit from the USACE were required to obtain a VWPP permit for the same activity to satisfy the Section 401 requirement. After the amendment the VWPP still serves as a 401

certification where the USACE has jurisdiction, but it maintains Virginia's jurisdiction where the Corps no longer has jurisdiction.

In 2001, state regulations creating four General Permits were approved and implemented: Water Permits WP1 for less than one-half acre projects, WP2 for utility line projects, WP3 for linear transportation projects, and WP 4 for development projects. In 2005, the four General Permits were revised and General Permit WP4 now may include activities directly associated with aggregate mining (i.e., sand, gravel, and crushed or broken stone), hard rock/mineral mining (i.e., metalliferous ores), surface coal mining, and natural gas and coal bed methane gas mining, as authorized by the Virginia Department of Mines, Minerals and Energy (DMME). In addition, DEQ revised the threshold for permits that do not require mitigation, limiting the stream impacts allowed to 300 linear feet. Now, all impacts must be mitigated for projects impacting up to a one-tenth acre of surface waters, including up to 300 linear feet. This revised threshold closed a loophole that allowed extensive stream impacts without mitigation. DEQ is also developing guidance-addressing standards for stream mitigation.

Lastly, DEQ is in the process of revising the VWP Regulations (9VAC 25-210-et.al) to include regulations for water supply projects. Information on how this revision will impact wetlands is not yet available.

Wetlands protection policies and standards

The Chesapeake Bay Program is committed to "achieve no net loss of wetlands acreage and function in regulatory programs." Wetlands are viewed as a key tool for achieving nutrient reduction goals for the Bay Program. While Virginia has been able to achieve "no net loss" for permitted non-tidal wetlands, success for permitted tidal wetlands is anticipated in the coming years due to a management change. Virginia's *Wetlands Mitigation-Compensation Policy* for tidal wetlands from 1993-2004 did not accomplish the "no net loss" goal, as there was a net loss of 132 permitted tidal acres during this period. This policy allowed projects affecting less than 1,000 square feet of tidal wetlands to proceed without mitigation requirements. The Virginia Marine Resources Commission (VMRC) realized that this allowance was probably the cause of the wetlands losses for the previous 10 years. With a grant from the Coastal Program in 2005, VMRC adopted revisions to the *Wetlands Mitigation-Compensation Policy*, which intend to achieve "no net loss" of tidal wetlands by requiring "compensation of all permitted tidal wetlands losses." This updated policy removes all minimum area exemptions and allows compensation requirements to occur through mitigation banks. Compensation can happen on or off site, through mitigation banks, or, as last resort, in the form of in-lieu fees. In-lieu fees would be applied to wetlands restoration and creation projects.

As a result of a grant from the Coastal Program, in May 2005, VIMS developed an *Interagency Shoreline Management Consensus Document* providing guidance for setting priorities for shoreline management in Virginia. The priorities, developed through collaboration with various state agencies, call for the least invasive approach. The four general categories of approach, from least to most impact, are 1) no action, 2) non-structural techniques, 3) combined non-structural and structural techniques, and 4) structural techniques. The priorities set in this document will be reflected in the permit review process.

In February 2004, DEQ issued Guidance Memorandum Number 04-2007 providing guidance on the analysis of avoidance and minimization of wetland impacts during VWP permit application review. The memorandum discusses the responsibilities of the VWP permit project manager, including analysis of physical constraints, design and construction, and conflicting requirements while considering all practical alternatives.

Assessment methodologies (health, function, extent)

DEQ has drafted a ten-year strategy for wetland monitoring and assessment in Virginia that is based upon EPA monitoring and assessment protocols. Rather than focusing on intensive monitoring of the quality of wetlands for the purposes of setting wetland water quality standards, Virginia's strategy is to use a three-tiered approach to wetlands assessment, which is currently being developed by Virginia in conjunction with other EPA-Region III states. This approach is designed to generate a nested data set, with a common minimum data set available for all identified wetlands in the state, and more extensive information available for selected subsets of wetlands and watersheds. This assessment approach will generate data used to conduct biannual reporting on the status and trends of wetlands as part of Virginia's 305(b)/303(d) Integrated Report, and to evaluate the effectiveness of regulatory and voluntary programs in meeting Virginia's mandate of a) no net loss of wetland resources through regulatory programs, and b) a net resource gain through voluntary programs. Development of DEQ's Wetland Monitoring and Assessment Strategy is being funded by a State Wetland Program Implementation Grant from the U.S. Environmental Protection Agency.

Impact analysis

Funded through the Coastal Program, the Cumulative Impact Assessment Protocol is an interactive tool used by DEQ non-tidal wetland staff. The tool maps Virginia's hydrological units and categorizes them by class and size. The tool also allows DEQ to provide a preliminary assessment of the impact to a small watershed area. A separate grant through the EPA will expand the tool to include the degree of threats to the area and function of a specific site.

The *Norfolk District Corps and Virginia DEQ Recommendations for Wetland Compensatory Mitigation* is an agreement between the Army Corps of Engineers and DEQ that is intended to be a guide for the development of compensatory wetland mitigation plans. The document addresses site design, permit conditions, performance, and monitoring criteria.

Restoration/enhancement programs and Wetlands creation programs

In October of 2000, Governor Gilmore established the Virginia Wetlands Restoration Coordinating Committee with a goal to increase wetland restoration on both public and private lands. The restoration and creation of wetlands is seen as vital for achieving Chesapeake Bay goals for nutrient reduction. The directors of the Department of Game and Inland Fisheries (DGIF) and the Department of Conservation and Recreation (DCR) chair the committee composed of a number of state agencies. The formation of the committee has increased cooperation between state agencies in terms of identifying high priority sites for wetland restoration, creation, or preservation.

Special Area Management Plans

Southern Watershed Area SAMP: Started in 1996 and funded through Section 309 funds, the Southern Watershed Area Management Program (SWAMP) has identified several areas to adopt program changes, including the Multiple Benefits Conservation Plan (MBCP) in 2001. The MBCP created a Conservation Corridor system with goals to link existing protected areas, protect critical habitat, and form a set of riparian buffers around the Northwest River, the North Landing River, and Back Bay.

The MBCP Memorandum of Agreement (MOA) is an agreement between several federal, state, and local governments. The MOA is intended to achieve several goals including: improvement of communication among the regulatory and resource agencies involved in the wetlands mitigation process in the SWA; fostering collaboration among these groups in the documentation of the protected lands and mitigation sites in the SWA; the encouragement of the selection of multiple benefits sites to compensate for wetlands impacts; and employing a shared methodology when selecting compensation sites for wetlands impacts. Currently, the MBCP MOA is being used to assist wetlands mitigation for both a new highway in the area and redevelopment of a Naval Base being closed in Virginia Beach.

Education/Outreach

DEQ's public education and outreach project strongly supports the Clean Water Action Plan national goal of at least 100,000 new acres of wetlands each year by the year 2005. Concurrently, the public outreach effort will assist in working towards the 6,000-acre Chesapeake Bay Program commitment and the overall 10,000-acre statewide restoration commitment by providing education and tools to Virginia's citizenry and local governments in order to implement their own wetland restoration/creation projects. Several training workshops have been held within the Chesapeake Bay drainage area of Virginia. As a partner to DEQ, the Alliance for the Chesapeake Bay has been responsible for scheduling four of these wetland education and outreach training workshops since the fall of 2003. The workshops were well attended, with an average of 50 people at each one. The workshops are open to all citizens interested in wetland restoration, members of watershed association groups, other established organizations, and local governments. The Alliance will work closely with Local Soil and Water Conservation Districts, Resource Conservation & Development Programs, local governments, and existing watershed organizations to plan the workshops.

In 2002, the General Assembly passed a voluntary certification program for professional wetland delineators, and expanded the Board of Certified Soil Scientists to include wetland professionals, thus forming the Board of Certified Soil Scientists and Wetland Professionals. This is seen by some as an important measure to improve education of homeowners and builders about wetlands and ways to protect them.

The VIMS Wetlands Program offers two tidal wetlands courses each year for wetlands boards and interested members of the public. The courses are held at VIMS and utilize their constructed "teaching marsh." Furthermore, the curriculum has been developed into self-taught education modules available online at the VIMS website. The teaching marsh is used for various courses arranged at the request of teachers, master gardeners, or the general public.

VIMS produces the Virginia Wetlands Report three times a year and distributes it to the wetlands board, the General Assembly, and others who request it. In each volume, the report discusses different issues relating to wetlands. VIMS also hosts a marine science day each year where hundreds of people from the public are invited to learn about marine ecology. The functions and values of marshes are discussed using the VIMS teaching marsh as an example.

Mitigation banking

The first freshwater tidal mitigation bank, the Heartquake Wetlands Bank, was established by JPM, Inc. in 2003. Located in King and Queen County, the bank consists of 35 acres along the Heartquake Creek. Also, the first saltwater tidal mitigation bank has been created in response to the new Wetlands Compensation Mitigation Policy. The Libertyville Tidal Wetlands Bank consists of about 7.5 acres of created wetlands in the city of Chesapeake to be sold as compensation for shoreline development that encroaches on wetlands. This is a positive first step in the implementation of the new policy and bears watching in the coming years.

Non-tidal wetland mitigation banks, however, are far more extensive in Virginia. The state has over 30 non-tidal wetland mitigation banks, more than half of which are located in the coastal zone. Several are owned by VDOT to offset losses due to road construction, while others are entrepreneurial ventures similar to tidal banks described above.

Guidelines for non-tidal wetland mitigation banking are currently being revised. The motivation for the revision is to include more detailed guidelines for stream mitigation. A date for release of these guidelines is not known.

Mapping/GIS/tracking systems

The DEQ plans to use GIS as part of its Wetland Monitoring and Assessment Strategy to identify and map Virginia's wetlands. Plans for this are underway, but work has yet to begin.

VIMS has developed a variety of GIS tools since the last assessment available on their website. Three of these tools, Blue Infrastructure as well as Waterfront Development and Marina Suitability, were funded by the Coastal Program.

The intent of the VIMS Blue Infrastructure project was to determine of which coastal resources are ecologically and economically significant aquatic resources and to assess the status of data available for each identified resource. The GIS-based model attempts to highlight where land use decisions may be in conflict with these sensitive and important aquatic resources.

The Waterfront Development tool uses a GIS-based model to balance expansion and economic growth with preservation of aquatic resources. The model analyzes existing land use, impacts to sensitive habitat, and potential impacts to water quality. Similarly, the Marina Suitability tool evaluates the appropriateness of sites for future marinas.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

The next logical step in managing Virginia's wetlands is to develop a "Net Gain" policy including specific measures that would help the state achieve this goal. In order to do this several gaps will need to be filled.

There needs to be more people on the ground to help identify sites for restoration, creation, and acquisition of wetlands as well as to monitor restored sites. The Virginia Wetlands Restoration Coordination Committee has improved cooperation between agencies, but this cooperation needs to be supplemented by people on the ground identifying potential sites. Related to this issue is the lack of data on restored and created wetlands. A dynamic wetland map delineating types and sizes of wetlands as well as whether they were restored or created would help with this cause. This could be addressed through DEQ's wetland mapping project. Also, there is a need to create linkages between reducing nutrients in TMDL implementation plans and identifying and targeting specific sites for wetland restoration, including consideration of whether new state policies would be helpful in creating these linkages.

Another gap is that acquisition of wetlands has become increasingly difficult as land values have significantly increased in recent years. In some coastal localities, waterfront property has increased over as much as 400% in only the last six years. Additional funding resources to acquire essential wetlands and protect them from development would further contribute a net gain goal. Public education and outreach could accomplish significant progress in the area of threats from development/ fill and a goal of net gain of wetlands.

There is a need for the officials that manage the permitting process for wetland losses to be kept up to date with wetland science. For example, educational outreach should be conducted for local wetlands boards about the critical value of "fringe" wetlands close to developed areas in comparison to more extensive wetlands further away from cities.

There is also a concern from local government officials that mitigation of wetlands doesn't happen close enough to the site of the lost wetland. Current guidelines call for mitigation of non-tidal wetlands to happen within 8-unit hydrological unit codes (HUC), which usually spans several counties. The 14-unit HUC is considered more appropriate for habitat and water quality benefits, and studies on this issue should be undertaken and presented to the General Assembly for the purpose of amending existing policies.

Finally, there is concern that the *Shoreline Management Interagency Consensus Document* will not be fully utilized as a tool for shoreline management. The next steps should be to get buy in from state agencies and local wetlands boards to use this document as the main guideline when considering alternatives for shoreline structures.

2. What priority was this area previously and what priority is it now for developing a 309 Strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

The priority of wetlands in Virginia remains high due to the clear need for comprehensive data on the function of restored and created wetlands and potential sites for wetland restoration and creation, as well as the need to address wetland losses due to unregulated activities. A strategy will use data to help move towards a net gain of wetlands.

Cumulative and Secondary Impacts

Section 309 Programmatic Objectives (see Attachment B for more detailed discussion)

I. Develop, revise or enhance procedures or policies to provide cumulative and secondary impact controls.

Resource Characterization

1. Identify areas in the coastal zone where rapid growth or changes in land use require improved management of cumulative and secondary impacts (CSI). Provide the following information for each area:

- **Type of growth or change in land use (e.g., residential, industrial, etc.)**
- **Rate of growth or change in land use**
- **Types of cumulative and secondary impacts**

According to U.S. Census Bureau estimates, Virginia's population increased 5% from 2000-2005. Over that time, coastal zone cities and counties absorbed 65% of the state's overall population growth. In each of the past five years, the population of the coastal zone steadily represented 63% of the state's total population, while only covering 29% of Virginia's land area. Continued growth is forecast by a NOAA report, *Population Trends Along the Coastal United States: 1980-2008.* According to NOAA, Fairfax County is expected to have the greatest population increase of coastal counties in the Northeast for the five-year period 2003-2008.

As reported in the previous Assessment, Virginia's coastal zone is experiencing continued suburban growth around the three major population centers of Washington, DC/Northern Virginia, Richmond and Hampton Roads. In the past five years (2000-2004), rapid growth continued in many jurisdictions reported in the previous Assessment, most notably Stafford County with the highest rate of growth at 23%, Spotsylvania County (22%), Prince William County (19%), and the City of Suffolk (19%). The coastal zone counties of New Kent, James City, King George, Hanover and Isle of Wight also experienced double-digit growth rates. With the exception of Loudoun County in northern Virginia, the five fastest-growing jurisdictions in Virginia are all within the coastal zone. Slight population declines were estimated in only six of the 46 coastal zone jurisdictions: the Cities of Alexandria (-1%), Portsmouth (-1%), Petersburg (-2%), Arlington (-2%) and Richmond (-3%). The highest rate of decline was estimated in Williamsburg City at -4%.

With much of its population growth focused in formerly rural coastal zone counties, Virginia is experiencing the effects of sprawling residential development. NOAA reports that from 1999-2003, 142,000 single-family and 40,000 multi-family residential building permits were issued in Virginia's coastal zone. This growth represents 66% of the state's building permits issued for single-family and 43% for multi-family residential buildings.

In addition to sprawling suburban growth, Virginia continues to experience waterfront development that directly impacts its 5,000 miles of tidal shoreline. According to the

Chesapeake Bay Program, the Bay watershed has the highest land to water ratio of any estuary in the world, making its waters particularly susceptible to the cumulative and secondary impacts of shoreline development. Waterfront property in some parts of the coastal zone has appreciated an average of 400% over six years.[15] Demand for private residential and commercial property on Virginia's shorelines also reduces public access. *(Please see Public Access section for more details on privatization.)*

Land use change in the coastal zone is of concern especially where wastewater infrastructure is not present. As the fastest-growing coastal jurisdictions are rural and lack central wastewater infrastructure, growth management has historically been achieved through a parcel's capacity for onsite treatment. In 2000, the Virginia Department of Health's Onsite Sewage Disposal Standards (OSDS) were changed to allow engineered septic systems that do not rely on the soil as a treatment medium. This change has removed a limiting factor in the local government's ability to anticipate, plan for and manage growth, opening previously undevelopable coastal land to development. From 2000-2005, jurisdictions within the Middle Peninsula Planning District have seen the installation or permitting of permitted 1,200 new engineered septic systems. This change also impacts wetlands, as OSDS are exempt from the Non-Tidal Wetlands Act.

Growth and land use change in the coastal zone is characterized by conversion of forest and agricultural lands. In 2001, DEQ reported that Virginia ranked eleventh in the nation for the rate of land conversion, with approximately 68,700 acres per year changed from farming and forest to residential and commercial uses. This conversion of farmland and forest represents a reduction and fragmentation of wildlife habitat.

Three sensitive areas identified in the coastal zone with a combination of sensitive resources and growth pressures are the Seaside, the Southern Watersheds, and Dragon Run. These areas are in need of continued management to mitigate damage to sensitive coastal resources from CSIs. (*For more reading on sensitive areas, see the section on Special Area Management Planning*).

2. Identify areas in the coastal zone, by type or location, which possess sensitive coastal resources (e.g., wetlands, water bodies, fish and wildlife habitats, threatened and endangered species and their critical habitats) and require a greater degree of protection from the cumulative or secondary impacts of growth and development.

Area	**CSI Threats/Sensitive Coastal Resources**
1. Aquatic Resources (e.g. SAV beds, oyster reefs, fishery management areas)	Water quality impacts from point and nonpoint sources; direct impacts from structure impacts (breakwaters, docks, piers etc.); direct impacts from dredging
2. Riparian zone (e.g. tidal wetlands, riparian buffers, dunes, natural shorelines, native shoreline vegetation)	Direct impacts to the resources from development; privatization of the shoreline impacts public access

[15] Data estimated from initial data from 2005 Northumberland and Westmoreland County real estate assessment.

3. Upland Areas (e.g. forests, nontidal wetlands)	Loss of vegetative cover; habitat fragmentation from development

Identifying and Mapping Critical Resources

Since the last Assessment, state agencies have undertaken various initiatives to identify critical resources and make coastal resource data and mapping functions available to citizens, agencies, businesses, and local governments. Many of these initiatives have been funded by the Virginia Coastal Program with Section 309 funding under the Integration Strategy. The gaps identified in the last Assessment are significantly addressed by the ongoing development of these inventories. They have tremendous potential as tools for enhanced management of shoreline land use and coastal resources, as well as environmental review.

Green Infrastructure / Virginia Conservation Lands Needs Assessment (VCLNA)

The Virginia Department of Conservation and Recreation (DCR), with funding assistance from the Virginia Coastal Program and from the Virginia Land Conservation Foundation, completed a pilot Natural Landscape Assessment (NLA) for Virginia's Coastal Resources Management Area. The NLA is a landscape-scale GIS analysis of unfragmented natural habitats (cores) prioritized by ecological values, notably their value as habitat for interior-dependent species sensitive to fragmentation. A large-scale Natural Landscape Assessment tool for all of Virginia (VANLA) is also under development as part of the larger VCNLA. The NLA serves as a base layer for Green Infrastructure mapping, and is a flexible tool that can identify Green Infrastructure according to the needs and strategies of different conservation interests.

In this ongoing project, with the guidance of a Green Infrastructure Advisory Workgroup composed of key Coastal Partners, DCR will undertake use of the VCLNA to map a consensus Green Infrastructure for the Coastal Zone. The VANLA and the Coastal Zone Green Infrastructure are a large part of the Virginia Coastal Zone Management Program's Blue-Green Mapping Project and Policy Integration Strategy developed during the last 309 Planning Cycle to better link local land use ordinances to state water use policy.

INteractive STream Assesment Resource (INSTAR):

INSTAR is an interactive online tool developed by Virginia Commonwealth University's Center for Environmental Studies. INSTAR provides access to an extensive dataset for stream reaches throughout Virginia's coastal zone, including instream habitat and stream geomorphology. INSTAR has the capability to model streams in the coastal zone and assign 'stream health' values. http://instar.vcu.edu/about.htm

Virginia Forest Resource Information Mapper (ForestRIM)

An online interactive mapping tool developed by the Virginia Department of Forestry (DOF) provides access to over 100 maps, including forest resource information, aerial photos and topographic maps. http://www.forestrim.org/

Comprehensive Coastal Inventory

The Comprehensive Coastal Inventory (CCI) Program of the Virginia Institute for Marine Science (VIMS) monitors tidal shoreline conditions in order to develop policy and management recommendations for Virginia.

Tools developed by the CCI since the last assessment include:

- *Shoreline Situation Reports:* Detailed shoreline condition inventories for 11 coastal localities.
- *Blue Infrastructure (BI)*: Online interactive mapping tool that provides spatial information for Virginia's aquatic resources. The ecologically and economically significant aquatic resources (marine and freshwater) within the coastal zone, including oyster reefs, blue crab sanctuaries and aquaculture sites were mapped to help coastal land use planners better understand the potential impacts of proposed shoreline development on these resources.
- *Marina Suitability Tool:* This tool ranks suitability for marina siting based on three major categories: habitat, water quality, and design. Three possible levels of suitability can be assigned for a site: high (desirable), moderate (desirable with limitations), low (undesirable).
- *Wetlands Mitigation Targeting Tool:* This tool was created to identify sites suitable for the creation of wetlands as a mitigation measure.
- *Wetlands Data Viewer:* This tool allows users to obtain National Wetland Inventory (NWI) statistics for any hydrologic unit in Virginia.
- *Waterfront Development Tool:* This tool assists land managers by evaluating conditions on the landscape based on three major categories: existing land use, impacts to sensitive habitat, and potential impacts to water quality. The GIS-based model ranks criteria based on a designated set of rules and conditions.

Management Characterization

1. Identify significant changes in the state's ability to address CSI since the last assessment (e.g., new regulations, guidance, manuals, etc.). Provide the following information for each change:

- **Characterize the scope of the change**
- **Describe recent trends**
- **Identify impediments to addressing the change**
- **Identify successes in improved management**

Regulations

Revised Regulations and Guidance for Local Governments

In December 2001, the Chesapeake Bay Local Assistance Board (CBLAB) amended the Chesapeake Bay Preservation Area Designation and Management Regulations to reduce CSIs and better protect the Bay's water quality and habitat. Local governments incorporated these

revised regulations by December 31, 2003. To assist localities in following the revised regulations, the CBLAB approved official guidance documents on the following topics in 2002 and 2003:

- Exceptions
- Nonconforming structures and uses
- Silvicultural operations (revised 6/16/03)
- RPA: Onsite buffer area delineation
- RPA: Buffer area encroachments
- Stormwater management requirements
- Agriculture: Soil and Water Quality Conservation Assessments
- Determinations of Water Bodies with Perennial Flow
- Administrative Procedures for the Designation and Refinement Of Chesapeake Bay Preservation Area Boundaries
- Resource Protection Areas: Permitted Development Activities

Stormwater Management

The 2004 General Assembly voted to transfer National Pollutant Discharge Elimination System (NPDES) permitting authority for combined municipal sewer systems and construction activities from the Virginia Department of Environmental Quality (DEQ) to the Virginia Department of Conservation and Recreation (DCR). As of January 2005, DCR is responsible for NPDES permits for the control of stormwater discharges from municipal sewer systems and land disturbing activities under the Virginia Stormwater Management Program. The construction permitting authority has been transferred to DCR with the anticipation that it will eventually be transferred to local governments, streamlining the permitting process for commercial and residential construction.

Wetlands Mitigation/Compensation

The Virginia Marine Resources Commission (VMRC) amended its Wetlands Mitigation/Compensation Policy in 2005 to achieve a no-net loss of wetlands in the tidal wetlands regulatory program. It was noted that between 1993 and 2004 the Commission had approved permits that created a loss of 132 acres of tidal wetlands, but only approved compensation for about 20 acres. The updated policy removes all minimum area exemptions and allows compensation requirements to be met through mitigation banks (*see Wetlands section for further detail*).

Water Quality Standards

In June, 2005 Virginia adopted statewide water quality standards for dissolved oxygen, chlorophyll-*a* and water clarity to meet nutrient reduction criteria for Bay and tidal tributaries. These standards are designed to protect migratory fish spawning and nursery, shallow water habitat for submerged aquatic vegetation, open water, deep water and deep channel water habitat for aquatic life. Additional water quality standards for chlorophyll-*a* and dissolved oxygen specific to the James, Mattaponi and Pamunkey Rivers are eligible for final action in November. As an aid in achieving these new water quality standards, nutrient load caps have been set accordingly in permitting for point source discharges.

Guidance

Better Land Use Planning in Coastal Virginia
Developed through Section 309 funding for improving Shoreland management, this 30-page document released in November 2004 outlines the land use pressures on Virginia's coastal resources and provides case studies, tools and recommendations to local governments to improve site planning and reduce CSIs. This report offers local governments specific recommendations for implementation through comprehensive plans and ordinances. CBLA is developing a companion website that is intended as a clearinghouse for land use efforts that protect Virginia's coastal resources.

Riparian Buffer Manual
On September 15, 2003 CBLAB approved the final draft of the *Riparian Buffer Modification & Mitigation Guidance Manual*. The manual includes guidance for local governments in the development of ordinances to better implement the buffer modification provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations.

Local Watershed Management Planning in Virginia
In 2003, DCR released a guide for local governments on preparing watershed management plans entitled *Local Watershed Management Planning in Virginia, A Community Water Quality Approach*. The guide provides the process for developing a watershed plan and key components for a successful strategy.

Policy

Stream and Buffer Restoration
In 2005, two Executive Orders were issued for stream restoration and riparian buffers. Executive Order 90, Improving Stream Health and Water Quality by Restoring Streams throughout the Commonwealth, establishes the Stream Restoration Initiative that will promote and coordinate stream restoration activities at state and local levels. Executive Order 91, Preserving Water Quality by Establishing Riparian Buffers in Chesapeake Bay Watershed, revised the Riparian Buffer Implementation Plan to restore and conserve riparian buffers along stream and rivers.

Low Impact Development Assessment Task Force
In 2003, the Virginia General Assembly legislation created the Low Impact Development Assessment Task Force (LID-TF). In its preliminary report to the General Assembly in November 2003, the Task Force noted that while LID techniques hold promise for stormwater management and watershed planning, they are still relatively uncommon and underutilized in Virginia. The LID-TF intends to produce a model ordinance for local governments and a certification process and criteria for LID practices. A workgroup of the Task force produced a technical memorandum on how to incorporate LID practices into existing regulatory requirements for stormwater management and wetlands protection that is being considered by the Department of Conservation and Recreation.

Tributary Strategies

In January 2005, the office of the Secretary of Natural Resources released the final *Nutrient and Sediment Reduction Tributary Strategy for Virginia's Chesapeake Bay Basins.* These strategies represent a reduction of nutrients (nitrogen and phosphorus) and sediments to meet the goals for the Chesapeake Bay set by the EPA. The development of these strategies represents a crucial step in addressing water quality from nonpoint sources.

Stormwater Management

The Virginia Department of Transportation has consolidated its efforts to implement Erosion and Siltation Control, Stormwater Management, VSMP Construction Permitting and MS4 Programs. VDOT formed two teams, the Stormwater Program Technical Team, and the Stormwater Program Policy Team. This change represents a significant step toward coordination of stormwater management activities at VDOT to reduce CSIs.

Shoreline Management

As a result of a grant from the Coastal Program, in May 2005, VIMS developed an *Interagency Shoreline Management Consensus Document* providing guidance for setting priorities for shoreline management in Virginia. The priorities, developed through collaboration with various state agencies, call for the least invasive approach. The four general categories of approach, from least to most impact, are 1) no action, 2) non-structural techniques, 3) combined non-structural and structural techniques, and 4) structural techniques. The priorities set in this document will be reflected in the permit review process. *(See sections on Wetlands and Coastal Hazards for more detail.)*

Training

Low Impact Development Workshops

In December 2003, the Virginia Department of Environmental Quality, the Virginia Department of Conservation and Recreation, the Division of Chesapeake Bay Local Assistance and the Corps of Engineers' Norfolk District held five workshops on Low Impact Development throughout Virginia. The workshops introduced LID principles to the public and gathered comments from participants on the role of LID in the review of development projects.

Low Impact Development Video

The Northern Virginia Regional Commission produced an educational video entitled *Reining in the Storm, One Building at a Time.* The video provides an overview of LID techniques such as green roofs, planted buffers, permeable pavers, and rain barrels, for commercial and residential properties. The video has great demand and has been screened in many coastal communities.

Funding

Land Conservation and Acquisition

The Virginia Land Conservation Foundation (VLCF) provides state funding to conserve open spaces and parks, natural areas, cultural and historic areas, and farmland and forests. The VLCF

was first funded in 2000, and has awarded $13.2 million in grants that preserved15,671 acres. For FY 2005, $10 million is available in grants, divided equally among four categories: natural area protection; open spaces and parks; farmlands and forest preservation; and historic area preservation. Review of grant applications in provided by an Interagency Taskforce. Additional criteria requested by the General Assembly in 2005 are: local drinking water supply protection; status of the parcel under a locality's master plan as a Chesapeake Bay Preservation Area; the extent to which the parcel has water quality benefits and/or the affected locality has identified the parcel in its comprehensive plan as having important local water quality benefits; the general value of the parcel in satisfying the primary categories compared to alternatives; wildlife benefit; and the degree to which the parcel satisfies recreational needs as identified in the Virginia Outdoors Plan and/or a local comprehensive plan. *(For more information on the Virginia Outdoors Plan, see Public Access.*)

The Virginia Outdoors Fund (VOF), administered by the Virginia Department of Conservation and Recreation (DCR), is a grant program for acquisition and development of public outdoor recreation areas and facilities. VOF funding is available to towns, cities, counties, regional park authorities and state agencies for 50 percent matching assistance.

Since the last Assessment, the Virginia Outdoors Foundation, the state's primary holder of conservation easements, has obtained 150,000 additional acres, over half of the total 290,367 acres held in easement. Of this total, only 27,613 acres are within the coastal zone. However, the Foundation holds easements within the larger Chesapeake Bay Watershed totaling 270,430 and owns 3,410 additional acres within the watershed.

Nonpoint Source Pollution

Funding mechanisms available to reduce nonpoint source pollution include: the DEQ Coastal Nonpoint Pollution Program, Section 319 funds, Water Quality Improvement Funds for agricultural best management practices (BMPs), DEQ Chesapeake Bay Program implementation grants, and DCR Chesapeake Bay Watershed Grants.

Land Use and Transportation

The General Assembly identified $4 million for ground transportation planning and research. With these funds, The Virginia Department of Transportation has awarded 15 grants to planning district commissions for initiatives including linking transportation and land use planning.

Local Programs

Since the last assessment, many local and regional initiatives have been developed to address issues such as watershed protection, buffer restoration, green infrastructure, wastewater and stormwater management, and low impact development. An example is a recent partnership between James City County, Builders for the Bay, and the Center for Watershed Protection to convene a roundtable to examine and redesign each of the County's ordinances to eliminate impediments to water quality protection.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy (i.e., inadequate authority, data gaps, inadequate analytical methods, lack of public acceptance, etc.).

As land use decisions that result in CSIs are predominantly made at the local level, the major challenge faced by the state in addressing CSIs is coordination with local governments and private landowners. While many tools are available to address land use impacts on coastal resources, these localities may lack the resources, training, or political will to effectively use these tools. Local governments in Virginia vary in their levels of staff and resources with which to implement ordinances and address land use decisions. One agency providing assistance to coastal watershed localities in Virginia to address impacts from land development and agriculture that ultimately impact coastal resources is the Division of Chesapeake Bay Local Assistance (DCBLA). While DCBLA provides a high level of technical assistance to coastal zone communities, recent reductions in funding may reduce its ability to do so, causing pressure on local governments to implement the Bay Act with reduced guidance and resources. It would be appropriate for the Coastal Program to provide leadership in addressing the problems associated with lack of knowledge and leadership by developing and delivering sustained professional workshops for local government staff, a primer for elected officials, and education of coastal property owners.

Local governments, in turn, face challenges as they develop innovative programs that go above and beyond requirements to mitigate CSIs. Often, due to Virginia's status as a Dillon Rule state with regard to local powers, municipalities are prohibited from enacting more stringent standards than the state explicitly requires. A state-level planning agency could address these difficulties by identifying the needs of localities, advocating for changes through the legislature, and coordinating resources that can be provided to localities to mitigate CSIs through low impact development, stream restoration, riparian buffers, and most importantly, growth management. This agency could also be charged with identifying and developing mechanisms for funding implementation projects by localities. The Coastal Program's role in this effort would be to convene a roundtable that would scope the need, role, and steps necessary to establish a state-level planning agency or office. Much like CBLAD was created as an outcome of the Chesapeake Bay Roundtable, a state planning agency is envisioned as the potential outcome of a stakeholder consensus-building roundtable.

A major gap in state and local government coordination to address CSIs relates to onsite sewage discharge. In addition to the growth management issues and impacts on non-tidal wetlands stemming from approval of alternative septic systems in the coastal zone, an issue of concern is the privatization of onsite septic assessment, which raises fears that privatized soil evaluators will be pressured to approve septic systems in order to continue receiving business from developers. Further, alternative onsite septic systems require regular maintenance and homeowners have not proven to be reliable and responsible operators of these systems. The Coastal Program could provide leadership in this area by convening a task force to identify and develop ways in which localities can ensure proper maintenance of these alternative septic

systems; one possibility would be the adoption of enabling legislation that permits localities to require licensed inspection and operation of these systems. Another opportunity for Coastal Program leadership would be in gathering data from local health departments on the number of septic systems installed in nontidal wetlands, for which there is currently no permitting or tracking available; this would lead to an assessment of the issue to determine if new enforceable policies are needed for septic systems in the coastal zone.

An additional waste disposal concern is that of packaged wastewater treatment plant discharges. Through NPDES permitting, these discharges often require the prohibition of shellfish aquaculture in the surrounding waters, potentially limiting shellfish harvest. The Coastal Program should consider taking leadership in assessing these discharges to determine if new enforceable policies are needed.

Another challenge in addressing CSIs is the inherent difficulty in demonstrating causal relationships between land use and pollution, and the associated challenge of quantifying the success of programs to reduce impacts. An opportunity for the Coastal Program could be to identify existing research on the causal links between land use and pollution, and gaps in that research that could be productively pursued. The second phase of this effort would be to prioritize the identified research needs and determine which program should best oversee this research. This research ultimately would be used to inform the need for new enforceable policies relating to land use and pollution.

Appropriate shoreline development has been defined loosely in several pieces of legislation. However, a functional, detailed definition of appropriate development to guide localities in their decision-making has yet to be developed. While this is clearly a difficult undertaking, it seems an appropriate project for the Coastal Program to initiate. Ideally, this definition would be developed through a consensus-building effort with support from all stakeholders for the ultimate definition. Recognizing that this may be an impossible goal, a modified effort would be to commission a study by an institution respected by the various stakeholders. The definition of appropriate development could then serve as the basis for a model ordinance for localities, building on the model ordinance of the LID Task Force mentioned above.

Transportation in Virginia's coastal zone represents a major gap in effective, proactive management of CSIs. The General Assembly funding for transportation research represents a step in this direction. To further examine the relationship between transportation and sprawling land use patterns, the Coastal Program may wish to consider conducting a survey of whether and how other states have linked transportation project approvals to consideration of impacts on coastal resources. This survey could examine policies adopted by other states to encourage alternative transportation modalities in the coastal zone, and the adaptability of these policies to Virginia.

It is also recommended that the Coastal Program and its partners continue to improve the data available on the changing land uses and coastal resources. Since the last Assessment, major improvements have been made using new technology to map and inventory coastal resources. Two suggestions for future inventories are that local governments be asked to report changes in the shoreline and that an inventory of buffers be conducted, including their soil characteristics

and depth, to add to the resources available for coastal planning. Related to the need for a buffer inventory is the need for a study whether these buffers actually work in providing the nutrient removal services predicted.

2. What priority was this area previously and what priority is it now for developing a 309 strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

Among the enhancement areas, Cumulative and Secondary Impacts represent the greatest potential impact to coastal resources. The continued high priority ranking reflects this, as well as the appropriateness of Virginia Coastal Zone Management Program's taking a leadership role in addressing CSIs.

Marine Debris

Section 309 Programmatic Objectives

I. Develop or revise programs that reduce the amount of marine and/or lake debris in the coastal zone.

Marine/Lake Debris Characterization

1. In the table below, characterize the extent of marine/lake debris and its impact on the coastal zone.

Source	**Impact** (significant/moderate/insignificant)	**Type of Impact**
Land-Based	Moderate to Significant	• Aesthetic impacts affecting tourism. • Economic impacts related to beach management practices by the municipalities and costs to tourism. • Human health and safety issues related to water quality. • Impacts on wildlife and habitat.
Ocean-Based	Moderate to Significant	• Impacts on wildlife from entanglement and ingestion. • Boating safety issues. • Impacts on benthic, beach, and shoreline habitat.

2. If any of the sources above or their impacts have changed since the last Assessment, please explain.

According to data from the International Coastal Cleanup program conducted annually in Virginia by Clean Virginia Waterways at Longwood University, land-based activities continue to generate approximately 80% of the marine debris items, while ocean-based sources account for 6% of items collected. This is consistent with national marine debris trends. The impacts of marine debris in Virginia continue to be aesthetic, economic and tourism impacts of debris on beaches and other recreational areas. Other impacts of concern in Virginia are potential effects on human health (especially from combined sewer overflows), wildlife and their habitat, and boating safety.

Land-Based
In Virginia, almost all land-based debris is attributed to shoreline recreational activities. Items such as cigarette filters, beverage cans and bottles, food containers and wrappers, and balloons are among the top ten most commonly found items. While mass releases of balloons are illegal in Virginia, balloon debris is found more frequently on beaches than in and around other state waterways. Since balloon debris can resemble jellyfish, they are a potential ingestion hazard to wildlife when mistaken for prey. Ribbons and strings on balloons also present an entanglement risk. Cigarette filters ranked as the second most common items found on beaches in Virginia's 2004 Coastal Cleanup. Smoking-related debris accounted for 12% of items collected in 2004 and 16% in the 2001 cleanup. Cigarette litter, often the result of roadway litter washing into waterways, represents a specific marine debris hazard in that it is both floatable and toxic. Other potential sources of land-based debris are combined sewer overflows and storm runoff.

Severe storm events can cause a massive influx of debris into Virginia's waterways, wetlands and coastal areas. The Virginia Department of Emergency Management reports that 20 million cubic yards of debris were generated during Hurricane Isabel, and debris removal costs reached $179 million. In such storm events, modern building materials and household goods such as asphalt roofing tile, vinyl siding and propane tanks, generate a high volume of debris that is relatively less biodegradable and more expensive to remove than those used more commonly in the past.

Ocean-Based
While only 6% of debris items found in the 2004 Coastal Cleanup were attributed to ocean-based activity, these items are often large and present direct risks to wildlife and boating safety. Derelict gear, defined as rope, fishing nets and other gear discarded or lost from vessels, has attracted concern as an entanglement hazard to boats and wildlife. Two sources of derelict gear of concern in Virginia's waters are that of unattended and unmarked or "ghost" crab pots and discarded or abandoned clam netting.

3. Do you have beach clean-up data? If so, how do you use this information?

The annual International Coastal Cleanup in Virginia is coordinated by Clean Virginia Waterways at Longwood University. The annual cleanup data is available for the use of the Coastal Program, as well as the Coast Guard, Virginia State Parks, and the National Park Service.

Many other cleanup efforts in Virginia are organized by local governments and non-profit advocacy organizations. These cleanups are not necessarily organized under the International Coastal Cleanup or Clean Virginia Waterways and annual statewide cleanup data are not available.

The Coastal Program and other agencies can use cleanup data to identify both specific sites and specific debris items (e.g. cigarette filters, balloons) that need to be addressed through pollution prevention and outreach programs.

Management Characterization

1. For the categories below, identify significant state ocean/Great Lakes management programs and initiatives developed since the last Assessment:

State/local program requiring recycling

No significant change. The Virginia Department of Environmental Quality (DEQ) continues to offer funding and technical assistance to local jurisdictions in the implementation of mandatory recycling programs.

State/local program to reduce littering

No significant change. Litter reduction remains a local function managed the litter coordinator in each Virginia locality, which is a function mandated by the state. Various state and local agencies continue to offer litter reduction programs such as Adopt-a-Highway, Adopt-a-Stream, Adopt-a-Beach and Adopt-a-Spot to reduce litter in coastal areas and waterways.

State/local program to reduce wasteful packaging

No new programs or initiatives.

State/local program managing fishing gear

The Virginia Institute of Marine Science is undertaking a study to develop a methodology to assess the impacts of derelict crab pots in Virginia's waters. The study will utilize side-scan sonar to georeference the location of derelict crab pots, creating a database from which to assess the pots' impacts to wildlife, crab catch, and boating safety. During the course of the pilot demonstration study on the lower York River, other derelict gear will be noted. The study will analyze potential impacts with a preliminary experiment on ghost pot trapping rates in some test areas. This study represents a step toward quantifying the impacts of derelict gear in Virginia's waters.

Marine debris concerns incorporated into harbor, port, marina, and coastal solid waste management plans

The Virginia Clean Marina Program, a cooperative effort of the Virginia Coastal Program, the Virginia Department of Environmental Quality, Department of Conservation and Recreation, and the Virginia Sea Grant office at the Virginia Institute of Marine Science, is a voluntary recognition program for marinas that go that extra step to protect coastal resources. Marinas are designated based on their compliance with a set of pollution prevention practices. The criteria include managing solid waste and educating boaters to reduce marine debris. There are currently 53 marinas participating in the Clean Marina Program, covering over 25% of the boat slips in the coastal zone.

Education and outreach programs

Clean Marina Program

The Virginia Clean Marina Program released a Clean Boating Tip Sheet as a best practices reference for boaters. The Clean Marina Program has also published fact sheets on Clean Boating and Waste Containment outlining best practices for proper waste disposal and recycling. For more information visit the Virginia Clean Marina Program Web site at: http://www.virginiacleanmarina.com/

Litter Awareness Campaign

During 2001-2004, the Department of Environmental Quality and the Virginia Litter Control and Recycling Fund Advisory Board developed and implemented an advertising campaign with the theme: *"Litter. It Just Isn't Natural."* The campaign included print, radio and television advertising aimed at litter awareness and reduction. In 2003, training sessions were held for program coordinators to maximize the campaign's effectiveness.

Lesson Plans

Many Virginia-specific lesson plans are available to aid educators in increasing awareness about marine debris and its sources. The Virginia Department of Game and Inland Fisheries has released a lesson plan entitled "Lingering Litter," which focuses on impacts to wildlife. The Clean Virginia Waterways program also makes lesson plans available through their website. The Virginia Department of Environmental Quality's Office of Environmental Education offers "Pollution Solutions," a curriculum supplement on litter and pollution prevention that includes marine debris issues and is designed to meet the Virginia Standards of Learning for grades K-12.

Cigarette Litter

Clean Virginia Waterways, the Virginia Department of Forestry and Virginia State Parks established a program in 2005 to distribute pocket ashtrays in State Parks, including those in the coastal zone. This program is aimed at reducing cigarette litter and its impacts, including contributions to forest fires and aquatic debris.

2. For the changes identified above provide a brief description of the change:

- Characterize the scope of the change
- Describe recent trends
- Identify impediments to addressing the change
- Identify successes

A major gap identified in the last Assessment was public awareness. Since the last Assessment, several new educational efforts have been launched to improve public awareness about marine debris in general, and also to target specifically the continuing problem of cigarette litter. It is too early to tell whether these efforts will result in a significant reduction into the volume of marine debris, but it is hoped a downward trend will emerge in the next five years, particularly in cigarette litter.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

One priority need for marine debris reduction is a continued public awareness campaign in which outreach and educational materials are distributed to the public and educators to increase awareness of marine debris. While high-quality materials have been developed, some are no longer available to educators and the public due to lack of funding. As part of this campaign, there is also a need for increased coordination with port facilities, tourism boards and gear manufacturers to increase awareness of the sources and impacts of marine debris. In addition, there is a need for increased awareness of local litter groups of the connections between land-based litter and marine debris.

Another gap appears to be the continued inability to quantify scientifically the nature and extent of marine debris. Currently all data is dependent on volunteer coastal cleanups, so the amount of debris collected depends on many variables, such as the number of volunteers involved, recent storms or other activity, and the areas covered. Further, the cleanups are focused mainly on coastal beach and stream areas, but not necessarily on debris floating at sea. An impediment to overcoming the lack of scientific data is that scientific protocols for data collection need to be pursued. Once protocols are established, studies are needed on the quality and quantity of marine debris and its impacts on fisheries and wildlife habitat. The VIMS preliminary study on derelict crab pots stands to build capacity at the state level to quantify the impacts of derelict gear, but much more is needed. A better understanding of the potential for different gear designs for specific purposes would help inform the development of potential new enforceable policies. These studies should be used as the basis for development of policies, enforceable by VMRC, for gear restrictions or modifications to reduce marine debris.

A major gap identified in the previous Assessment, that of state and regional coordination, still remains to be addressed. A major impediment to closing this gap is the lack of a central state office charged with reducing debris. The function of managing litter is assumed in part by various state agencies governing domains such as parks and roads, and in part by local governments through their litter coordinators. However, in practice, the issue of debris cleanup in Virginia continues to be the domain of cooperative efforts between nonprofit champions, such as Clean Virginia Waterways, state agencies, and local government efforts. Consideration should be given to the establishment of an inter-agency task force on marine debris that would explore mechanisms for state and regional coordination, including coordination of clean-up efforts and data collection and analysis. One issue this inter-agency task force might consider, although it is a difficult issue in Virginia, would be whether and how a strategy for beverage bottle and can redemptions might be developed.

Lastly, stormwater management could be enhanced along state and locally maintained roadways to prevent debris from entering streams and being deposited in coastal waterways.

2. What priority was this area previously and what priority is it now for developing a 309 Strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	___	High	____	High	___
Medium	_✓_	**Medium**	_✓_	**Medium**	_✓
Low	___	Low	____	Low	___

This ranking is based on the Coastal Policy Team's acknowledgment that marine debris, while not a high priority, is an issue of importance in Virginia that needs further effort. Specifically, the CPT recognizes that additional quantitative and qualitative data are necessary to better characterize the impacts of marine debris on Virginia's economy, wildlife, public health and boating safety.

Special Area Management Planning

Section 309 Programmatic Objectives (see Attachment B for more detailed discussion)

I. Develop and implement special area management planning in coastal areas applying the following criteria:

– Areas with significant coastal resources (e.g., threatened and endangered species and their critical habitats, wetlands, water bodies, fish and wildlife habitat) that are being severely affected by cumulative or secondary impacts;
– Areas where a multiplicity of local, state, and federal authorities hinder effective coordination and cooperation in addressing coastal development on an ecosystem basis;
– Areas with a history of long-standing disputes between various levels of government over coastal resources that has resulted in protracted negotiations over the acceptability of proposed uses;
– There is a strong commitment at all levels of government to enter into a collaborative planning process to produce enforceable plans;
– A strong state or regional entity exists which is willing and able to sponsor the planning program.

Resource Characterization

1. **Using of the criteria listed above, identify areas of the coast subject to use conflicts that can be addressed through special area management planning (SAMP).**

The list of areas identified in the following table as potentially appropriate for Special Area Management Plans was developed with the input of the Coastal Policy Team and other Coastal Program partners. These areas represent only preliminary recommendations and, upon further evaluation, may not necessarily meet all of the SAMP criteria.

Area	Major conflicts
Dragon Run	The Dragon Run SAMP has been in the development phase since 2002; its mission is to develop policies that support and promote community-based efforts to preserve the cultural, historic, and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed. Implementation of the polices developed is still needed in order to sustain the natural resource based economy, manage public access, and plan for future development.
Seaside Eastern Shore	This area holds tremendous potential to demonstrate appropriate management of economic development and habitat restoration within a rare and fragile ecosystem. Since 2002, the VCP has begun addressing these needs on the Seaside through restoring habitat, promoting ecotourism and working toward better management of these resources.

Mobjack Bay Drainage	The Mobjack Bay drainage contains extensive seagrass beds and salt marshes that are nursery grounds for Bay species. The Bay is currently experiencing extensive nonpoint source pollution impacts resulting in "dead zones." This area has potential for seagrass restoration and oyster restoration. There is also strong and historically significant connection to aquatic resources in the Mobjack. Multiple-authority conflicts exist between state, regional and federal fisheries management.
Upper York Watershed/ Mattaponi Drainage	This drainage contains the nation's premier tidal freshwater wetlands complex and the spawning and nursery grounds for important anadromous fish species. It also contains the location of the proposed King William reservoir and the proposed-for-expansion Lake Anna nuclear power plant. Development pressures (moderate along waterfront in King & Queen and King William Counties and high in headwaters) threaten the rural character, water quality, high quality stream system and habitat.
Pamunkey Drainage	Potential reservoir development would impact over 400 acres of wetlands and a relatively high quality stream system. The area is also impacted by rapid development in the Counties of New Kent and Hanover. Additional authorities include air and water discharge permitting for an industrial facility.
Harmful Algal Blooms (HABs) at mouths of James, York, Rappahannock	HABs result from high levels of nutrients and have potential to harm human and marine health. While HABs are widespread, a pilot SAMP might focus on one location.
Back Bay	This area contains recreational use conflicts with multiple agencies and stakeholders threatening riparian forest resource.
Grafton Plain, Lower Peninsula	This area is characterized by fragmentation of wetlands/coastal plain pond complex, including habitat for rare wildlife, due to urbanization. Conflicts between landowners/developers and regulatory agencies.
Secondary Dune Fields, Northampton County	Significant development pressure threatens three secondary dune field areas identified as critical structures in the 2002 inventory. These rare and valuable dune ecosystems are not protected from development by other state or local measures.
Cherry Hill Peninsula, Prince William County	This peninsula contains residential and commercial development of 1,800-acre riparian forest on the Potomac, including habitat for native and endangered plant species.
Hampton Tidal Wetlands and Dunes	Urban impacts on tidal wetlands and dunes.
Crow's Nest Peninsula, Stafford Co.	This peninsula's potential for development and associated CSIs on 3,500-acre forested peninsula is in conflict with river buffers, open space, recreational uses, endangered plant and animal species habitat, and historic sites.
Urbanna Creek/Rosegill Plantation, Middlesex Co.	This area contains large-scale residential cluster development on historic rural property adjacent to creek.
Chincoteague	This area contains shoreline development and wastewater treatment facility discharges in conflict with intense clam aquaculture.

Management Characterization

1. Identify areas of the coast that have or are being addressed by a special area plan since the last Assessment:

- Southern Watersheds of Virginia Beach and Chesapeake
- Dragon Run Watershed (portions of Gloucester, Middlesex, Essex and King & Queen Counties)
- Northampton County

2. Identify any significant changes in the state's SAMP programs since the last Assessment (i.e., new regulations, guidance, Memorandums of Understanding, completed SAMPs, implementation activities, etc.). Provide the following information for each change:

- **Characterize the scope of the change**
- **Describe recent trends**
- **Identify impediments to addressing the change**
- **Identify successes**

Southern Watersheds

Characterize the scope of the change
The Southern Watershed Area Management Program (SWAMP) was designed to protect and enhance the natural resources, sensitive lands and water supplies of the Southern Watersheds of the cities of Virginia Beach and Chesapeake. The Southern Watersheds encompass approximately 325 square miles and include the watersheds of Back Bay, the Northwest River and the North Landing River. The program has progressed through several stages over many years, with the Virginia Coastal Zone Management Program becoming involved in 1992. The program is intended to address coastal management problems in three specific areas: existing threats to water quality, habitat loss and water quality degradation due to development, and use/management conflicts.

Describe recent trends
Development continues to encroach into the Southern Watersheds as the metropolitan Hampton Roads area population continues to increase. Coordination with North Carolina has increased as localities and state agencies involved in Southern Watershed management have become more involved in the Albemarle-Pamlico National Estuary Program (APNEP).

Identify impediments to addressing the change
Public response to the planned Back Bay Water Use Memorandum of Agreement was overwhelmingly negative and this effort had to be redesigned. The negative response appeared to come from misinformation in the community, with many citizens expressing concern that the MOA was a vehicle for the U.S. Fish and Wildlife Service to limit access to Back Bay. Public opposition was due, in part, to Back Bay National Wildlife Refuge expansion plans. Efforts in this area were redirected to focus on education as a means of avoiding use conflicts.

Identify successes

The program has had the following successes during the period of 2001 to 2005:

1. A Technical Advisory Committee has begun implementing the Multiple Benefits Conservation Plan Memorandum of Agreement.
2. Educational materials have been developed as part of the North Landing River Water Use Conflict Memorandum of Agreement.
3. An educational brochure and signs have been developed as part of the Back Bay Water Use Conflict Educational Package.
4. SWAMP research materials have been included in the Chesapeake and Virginia Beach comprehensive plans.
5. An Open Space and Agricultural Preservation Program in Chesapeake has resulted in a purchase of development rights program that included prime agricultural lands and conservation lands identified in SWAMP research.
6. The "Preserve on the Elizabeth," a conservation subdivision in the Southern Watershed area based on a site plan designed by Randall Arendt as part of SWAMP, was approved and is under construction.

Dragon Run

Characterize the scope of the change

As one of the Chesapeake Bay watershed's most pristine waterways, the Dragon Run flows forty miles along and through non-tidal and tidal cypress swamp situated in portions of Essex, King and Queen, Middlesex, and Gloucester Counties. The Dragon Run plays a central role in the Middle Peninsula's culture and identity. Natural resources - forestry and farming - have been the bedrock of the watershed's economy. These land uses, together with extensive swamps and unique natural resources, are the main reasons that the Dragon Run remains wild and secluded.

The Dragon Run's unique character evokes strong feelings to protect the pristine watershed in both long-time residents and first-time visitors alike. Opinions differ about how to address the threats of encroaching development and habitat fragmentation. An innate difference in point of view between property rights advocates and conservationists centers on how to maintain a pristine watershed into the future. Yet, substantial common ground exists for proactively preserving the Dragon Run for future generations.

The Dragon Run SAMP's mission is to support and promote community-based efforts to preserve the cultural, historic, and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed. While the Dragon Run landscape is primarily undeveloped, changes in land ownership threaten to fragment productive farm and forest land and natural habitat and disrupt the local natural resource based economy. The SAMP is designed to address both the differences of opinion and the common ground that exist concerning the future of the watershed.

Describe recent trends

The natural resource base of the watershed (primarily agriculture and forestry) has sustained the local economies and protected the natural integrity of the Dragon Run Swamp for hundreds of

years. However, economic factors are driving recent changes in land holdings. One multi-national corporation owns nearly 25% of the watershed and is divesting its holdings. In addition, other areas of the four counties are under pressure to develop large tracts of forest and farm land. Fragmentation and conversion of these forests and farms to residential uses is a serious threat to the rural character and environmental integrity of the system. Local governments are struggling to identify and implement the tools necessary to protect vulnerable rural areas. Several local, state, federal and non-governmental entities have recently become active in acquiring land in the watershed for conservation, public access and research. The first piece of publicly owned property in the watershed was just purchased in 2002. Since that time thousands of additional acres have been acquired. This change in ownership has sparked public debates on public access and private property rights (e.g. how much is too much, who has rights to the water and its edge).

Identify impediments to addressing the change

Though trends in the watershed point to the need for immediate action to proactively put land controls in place to ensure that the cultural, natural, historical and economic character of the watershed remain intact, the citizens and elected officials that have spearheaded this effort are broaching new territory and are doing so sometimes cautiously. One of the few impediments to change is making sure that everyone is well educated on the issues and continues to remain engaged as elements of this plan move through the local government planning process (which can take years). This effort has produced several new planning tools and policies, some of which have been adopted. Assistance with *implementing* these new policies over the next two years will be crucial to the acceptance of the SAMP and its goals.

Identify successes

This proactive planning effort has resulted in many successes:

1. Adoption by the four counties in the watershed of a Memorandum of Agreement that states the goals and objectives of the SAMP
2. Establishment of a citizen-driven stakeholder participation process for developing a comprehensive watershed management plan.
3. Adoption of the Watershed Management Plan as an addendum to the county's Comprehensive Plan by 3 of the 4 counties
4. Development of model zoning and comprehensive plan amendments for each county to consider and to customize to achieve consistency with the principles in the watershed management plan
5. Establishment of an annual Dragon Run Day that celebrates landowner stewardship and the watershed's natural cultural and historic heritage.
6. Administration of an education and outreach program targeted at giving local decision makers and community leaders a hands-on watershed experience
7. Recommendations for management of public and non-governmental organization (NGO) holdings acquired for conservation
8. Presentation of sustainable economic development opportunities to local business, governments and landowners.
9. Establishment of an invasive species initiative made up of a coalition of universities, federal and state agencies, regional government and NGOs.
10. Establishment of baseline information on the status of the natural resources and land use planning policies in the four counties.

Northampton

Characterize the scope of the change

The Northampton County SAMP began in the early 1990s in an effort to protect migratory songbird habitat, public access and water quality. In addition, it sought to foster sustainable economic development in what ranks as one of the poorest counties of Virginia's coastal zone. Although several program changes were accomplished and reported in the April 2001 Assessment & Strategy, several originally identified program changes were not. Most important among those was adoption of a vegetation ordinance that would restrict removal of existing native shrubs and trees in the County in an effort to protect both song bird habitat and water quality. Unfortunately when the proposed ordinance was brought before the County Board of Supervisors for a vote in the late 1990s, it was defeated. During the 2001 – 2005 period the Coastal Program offered the County a second chance to adopt a vegetation ordinance and three grants were developed. The first two grants (FY 1999 Task 92 and FY 2000 Task 92) were for ordinance development and education efforts and the third (FY 2003 Task 96) was for implementation of the adopted ordinance. Using the FY 99 and 00 grants, the County established a new citizen committee and hired a new planner to guide the development of a revised "Sensitive Natural Resource Area Preservation Overlay District." Multiple public meetings were held, and a brochure developed that explained the purpose of the overlay district in protecting both groundwater and natural vegetation and wildlife communities. Once again an ordinance was brought before the Board of Supervisors for adoption. Once again, the Board failed to adopt the ordinance. The FY 2000 grant had been conditioned such that failure to adopt the ordinance would result in repossession by the Virginia Coastal Program of the plotter purchased with grant funds and withholding of $25,000 from the FY 2000 grant. Also, due to the County's failure to adopt, the FY 2003 grant was never awarded.

Describe recent trends

Some time after the second failure to adopt a vegetation ordinance, a Board of Supervisors election resulted in a very different Board – one that ran and won on a conservation platform. Those who had been vocal against the ordinance were voted out of office. The County continues to struggle with adopting some means of protecting their rural character, their critical wildlife habitat and their water quality.

Identify impediments to addressing the change

The impediments to adopting the change are largely political. Although County residents seem to want their rural character, water quality and wildlife resources protected, they fear restrictions of their private property rights and regulations that they believe may hinder economic development. Further and more intense public information efforts are needed as well as the creation of new policies on which the community can agree.

Identify successes

Perhaps the greatest success of the Northampton SAMP has been the increased recognition the area is receiving for its ecological importance – particularly as a critical stopover habitat for migratory birds. As a result of the research conducted under the SAMP, major conservation organizations such as The Nature Conservancy and the US Fish & Wildlife Service are now investing in major protection efforts. Recently the global headquarters office of TNC approved

the allocation of about $13 million to purchase land on the southern tip of the county. In addition, the national office of the USFWS approved the expansion of the Eastern Shore Refuge's acquisition boundary to include all those areas identified as critical songbird migratory habitat through the Northampton SAMP. It may also be fair to say that although the County Board of Supervisors still has not adopted a habitat protection ordinance, the makeup of the Board is now far more supportive of such efforts because of the work conducted under the Northampton SAMP.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

In addition to continued implementation efforts for Dragon Run, several special areas have been identified as potentially appropriate for SAMP processes. The areas highlighted above are each affected by the direct and/or cumulative and secondary impacts of increasing land development around the major population centers. The lessons learned from the Northampton, Dragon Run and Southern Watersheds SAMPs have yielded experience and built awareness that stand to benefit future SAMP processes.

One priority need identified for future activities is increased local and regional support for implementation of existing and future SAMPs. Challenges to implementation are often political and economic, and difficult to address directly through 309 strategies. As new SAMP processes are developed, it is critical that potential roadblocks to implementation be addressed as early on as possible.

One method to address these challenges to implementation is through public outreach and education. For future SAMPs, proactive public awareness events and campaigns are necessary to build understanding and foster citizen involvement to establish a base of support for implementation by local governments.

A second method, drawn from the success of Dragon Run, the challenges in the Back Bay MOU adoption and failure of Northampton overlay ordinance, is to require that citizen-driven public participation be used early, often, and as an integral part of new policy development. Public participation methods may range from stakeholder consensus building advisory committees, to community dialogues, community conversations, focus groups, community workshops and visioning, to name a few. Each SAMP may require a different approach that reflects the specific needs of the local populace and decision-makers. Public participation methods, when properly conducted, can provide an effective way to overcome impediments to policy changes identified in the three existing SAMPs, such as misinformation, lack of information, fear associated with change, lack of coordination, lack of public support, and lack of support by decision-makers. The key is that, if effort is going to be put into developing new policies, strong citizen-driven participation is essential to ensure that the proposed policies reflect broad stakeholder input and will receive support from both the citizens and leadership. Lessons from collaborative efforts throughout the nation indicate that if public involvement is needed at all, it should be initiated early in the process of policy development rather than later. Guidelines for public involvement

that could be incorporated into all future SAMP efforts are the "core values" proposed by the International Association for Public Participation (www.IAP2.org).

2. What priority was this area previously and what priority is it now for developing a 309 Strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

The Coastal Policy Team identified Special Area Management Planning as a continuing high priority due to its potential to drive public policy, especially at the local level. SAMPs represent a unique tool in the coastal zone to form partnerships to impact land use planning and increase citizen engagement in coastal issues. This ranking also reflects the continued implementation efforts necessary in Dragon Run.

Energy & Government Facility Siting

Section 309 Programmatic Objectives (see Attachment B for more detailed discussion)

I. Enhance existing procedures and long range planning processes for considering the needs of energy-related and government facilities and activities of greater than local significance.

II. Improve program policies and standards which affect the subject uses and activities so as to facilitate siting while maintaining current levels of coastal resource protection.

Management Characterization

1. Identify significant changes in the state's ability to address the siting of energy and government facilities since the last Assessment (e.g., new regulations, guidance, manuals, etc.). Provide the following information for each change:

- **Characterize the scope of the change**
- **Describe recent trends**
- **Identify impediments to addressing the change**
- **Identify successes**

Consistent with national trends and increasing energy costs, there is a rising interest in expanding options for energy production within the state. Virginia is currently a net importer of electricity, and rising costs of natural gas have caused concern, especially among industrial energy consumers. According to the Virginia Department of Mines, Minerals and Energy, petroleum (primarily for transportation) is Virginia's most used fuel (39%), followed by coal (21%), interstate electricity flows (14%), nuclear generated electricity (12%), natural gas (11%), wood and waste (4%), other (1%), and net hydropower (-1%). Of the natural gas consumed in Virginia, the growing residential sector currently uses the most (30%) as compared with industrial and other consumer types in Virginia.

Two other trends relating to energy facility siting have been noted in Virginia. The first is that Virginia is increasing in its role as a major transfer station for the export of coal, requiring additional infrastructure, and this may require the expansion of facilities within Virginia's Port Authority. The second is that the deposition of mercury and nitrogen in Virginia's streams and coastal waters is increasing, likely as a result of coal-burning facilities to the west of these waters, and is being monitored by the Coastal Program. These two trends bear watching and may merit attention in the future with regard to the development of new enforceable policies.

Two sources of energy currently being examined in Virginia have potential to impact the coastal zone: offshore gas exploration and production and utility-scale wind energy development. While not a new source of utility-grade energy for Virginia, the proposed expansion of nuclear energy generation facilities also have potential to impact the coastal zone.

Offshore Gas Study

Currently, a federal ban remains in place prohibiting offshore oil and gas leasing on the Outer Continental Shelf through June 2012. The 2005 General Assembly, seeking to identify ways to lower Virginia's energy costs and support economic development, ordered a study into the potential for offshore gas exploration and leasing. Virginia House Joint Resolution 625 directed the Secretary of Commerce and Trade, with staff support from the Department of Mines, Minerals and Energy and the Virginia Coastal Zone Management Program, to conduct a Study of Offshore Natural Gas Exploration and Production. The Secretary convened an advisory group, including the Secretariat of Natural Resources, industry representatives, and environmental organizations, to examine the issues involved. The study is intended to identify informational needs to characterize the extent of the resource; discuss processes for federal and state environmental review and permitting, including CZMA consistency review; and identify potential impacts on tourism and coastal and natural resources, including wildlife. The study, which will be complete by January 2006, is expected to greatly enhance the state's ability to address the siting of offshore energy facilities and anticipate their impacts.

It is also noted that the draft federal legislation entitled State Enhanced Authority for Coastal and Offshore Resources Act (SEACOR) would greatly expand the state's ability to address the siting of offshore energy facilities. This legislation would provide an expansion of states' jurisdiction over drilling activities beyond the traditional 3 nautical miles of state waters to 12 nautical miles. It would also include provisions for state veto over natural gas projects up to 40 nautical miles and oil drilling up to 100 nautical miles.

Wind Energy

Since the last assessment, interest in wind energy has developed in Virginia. A 2002 study commissioned by the Department of Mines, Minerals and Energy (DMME) and the US Department of Energy (DOE) identified the areas with significant wind energy potential as the ridgelines and mountaintops in the western part of the state, and offshore waters and exposed points and islands in the Chesapeake Bay and Atlantic. These coastal wind resources, while ranked second to those in Virginia's mountains, have a great potential to be developed in the coming years. In 2002, an offshore wind facility was proposed off the Eastern Shore. Due to Naval shipping concerns and other factors, the application has since been withdrawn and is no longer under review.

In July 2005, Highland County approved a conditional use permit for the first wind farm in Virginia to be sited on Allegheny Mountain. Although this project is in the western part of the state and does not directly impact coastal areas, the state review and approval process for this project will offer a case study for potential future offshore projects.

One impediment to the siting and approval process for wind energy has been identified as a lack of clarity or agreement on the appropriate party to conduct and verify impact studies, especially regarding avian impacts of wind facilities.

The Virginia Wind Energy Collaborative (VWEC) was established in 2002 at James Madison University as a forum for stakeholders in the development of wind energy facilities. The VWEC

Environmental Working Group (EWG) has developed a Landscape Classification System (LCS) a GIS-based mapping resource designed to incorporate natural resources in utility-scale wind siting. The LCS identifies the following coastal zone areas as "unsuitable" for wind utilities: submerged aquatic vegetation beds, state parks and natural areas, easements held by the Virginia Outdoors Foundation, and Nature Conservancy preserves. The following land uses were flagged in the LCS as potential land use conflicts: the Department of Conservation and Recreation's Natural Heritage sites, Department of Game and Inland Fisheries' Wildlife Management Areas, and Virginia Department of Forestry State Forests. The VWEC has also completed a study of local government zoning regulations as they apply to wind projects and the land uses associated with wind utilities, including transmission lines. The Virginia Center for Coal and Energy Research, at the request of the Commission on Electric Utility Restructuring, is currently developing an analysis to estimate the cumulative potential cumulative of wind and other renewable energy sources to meet Virginia's energy needs.

Another resource for wind facility siting is the National Wind Coordinating Committee, which has produced two guides on wind energy siting: *Permitting of Wind Energy Facilities: A Handbook* (August 2002) and *Wind Energy Siting Case Studies* (June 2005).

Nuclear Energy

Dominion Nuclear has applied to the Nuclear Regulatory Commission (NRC) for an Early Site Permit to reserve sites to add two reactors to its current two-reactor North Anna Power Station facility in Louisa County. A Draft Environmental Impact Statement (EIS) has been submitted that considers three additional sites for the expansion, one in Virginia at the existing Surry Power Station along the James River. If issued, this permit would reserve the selected expansion site for up to 20 years, and potentially allow site preparation and preliminary construction.

While the current site in Louisa County is outside the Coastal Zone, the North Anna is a coastal river. The alternate Surry Power Station site sits along the tidal James River. DEQ's Division of Water Resources considers the Surry site, as described in the Draft EIS, to be superior to the North Anna site based on the impacts on limited water resources in the North Anna watershed and downstream. Due to the potential impacts of this proposed expansion on coastal resources, DEQ recommended, and Dominion and the NRC agreed, to assess the effects of the project on Virginia's coastal uses and resources. Dominion has submitted a consistency certification, which is currently being reviewed by agencies administering the enforceable and advisory policies of the Virginia Coastal Program. While this proposed expansion does not represent a change in the State's ability to address the siting of nuclear facilities, the attention to impacts on coastal resources represents an important step in the review process.

Distributed Energy Resources

In 2003-2004, DEQ worked in collaboration with state, local and private organizations to complete a State Energy Program Special Project that identified administrative, economic and regulatory barriers to Combined Heat and Power and Distributed Energy Resources in Virginia. These generation systems offer potential for energy generation in coastal areas with significant electrical transmission constraints. Four workshops were delivered around the state to increase awareness and develop strategies to overcome the barriers identified through the project.

Information Resources
Since the last assessment, much more data has been made available on coastal resources that would potentially be impacted by offshore wind or natural gas facilities. In addition to research specific to energy siting, various projects have been undertaken by state agencies to map and characterize coastal resources such as wildlife habitat and migration, sensitive wetlands and riparian forests. Together, these data sets and new advances in geographic information systems (GIS) represent a knowledge base that offers great potential as a resource for decision makers in the siting of offshore facilities and associated infrastructure.

Conclusion

1. **Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.**

In response to the building interest in offshore gas and wind facilities, a priority need is for a proactive approach to addressing their potential impacts on the coastal zone. The forthcoming Offshore Gas Study and the Landscape Classification System are efforts towards this end, as are the experiences of other states in siting such facilities. In addition to their impacts on coastal resources, it is anticipated that the prospect of both kinds of facilities may instigate intense public discussion and controversy. Building a sound understanding about the potential benefits and impacts of such facilities will be critical for guiding these anticipated discussions.

A proactive approach is also needed in anticipating the regulatory approval and permitting processes for offshore gas and wind and the associated land connections and infrastructure corridors in the coastal zone. It is critical that the state and local agencies invited to comment on facility siting, including the State Corporation Commission; the Department of Environmental Quality; the Department of Mines, Minerals and Energy; and the Virginia Marine Resources Commission, take the opportunity to comment and collaborate in doing so. As offshore facilities have not been previously developed, certain issues, such as avian impacts, lack associated enforceable policies. The environmental review process for an offshore natural gas or wind facility would provide an opportunity for reviewing agencies to become engaged and more broadly assess impacts on coastal and marine resources.

An inter-agency task force with stakeholder involvement could offer one method of streamlining a regulatory and permitting framework for these anticipated facilities. Part of this approach could also involve a collaborative effort among federal, state and local governments to identify coastal areas and corridors most appropriate for siting of water-based and land-based infrastructure associated with offshore and energy utilities. An inter-agency task force would also serve to build partnerships among agencies in advance of any potential expansion of state authority over coastal resources. It is recommended that DEQ and the Coastal Program stay informed about any proposed expansion of the state's authority over mineral resources beyond the existing 3 nautical mile boundary, such as that proposed in the draft State Enhanced Authority for Coastal and Offshore Resources (SEACOR) Act of 2005.

2. What priority was this area previously and what priority is it now for developing a 309 Strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High		High		High	
Medium		Medium		**Medium**	✓
Low	✓	**Low**	✓	Low	

The medium priority ranking for this enhancement area reflects the emerging issues of siting of offshore wind and natural gas facilities. While the federal ban on new offshore leasing remains in place until 2012, increasing interest in alternative source of energy has brought additional awareness to offshore facility siting. In the future, this area may be ranked as a high priority based on the results of the General Assembly-commissioned *Study of Offshore Natural Gas Exploration and Production*, to be released in late 2005.

Aquaculture

Section 309 Programmatic Objective

I. Enhance existing procedures and long range planning processes for considering the siting of public and private marine aquaculture facilities in the coastal zone.

II. Improve program policies and standards which affect aquaculture activities and uses so as to facilitate siting while ensuring the protection of coastal resources and waters.

Resource Characterization

1. Briefly describe the state's aquaculture activities.

Definition

Virginia's 1992 Aquaculture Development Act defines aquaculture as the "propagation, rearing, enhancement, and harvest of aquatic organisms in controlled or selected environments, conducted in marine, estuarine, brackish or fresh water." Marine aquaculture represents Virginia's fastest growing industry and 85 percent of the total revenues of the aquaculture industry. The majority of marine aquaculture conducted in Virginia involves clams, oysters and soft-shell crabs. The industry has grown slightly since the last assessment. Furthermore, there has been extensive research and several programs have been implemented in an attempt to further restore the industry.

State Programs, Regulations, Statutes, and Guidelines

Aquaculture farmers are not required to have a license to grow in Virginia; however, numerous agencies are responsible for regulating portions of marine aquaculture activities. The Virginia Department of Agriculture and Consumer Services (VDACS) is the lead agency in the state for aquaculture development and has responsibility for ensuring that facilities used to process and package food fish and shellfish are sanitary. The Virginia Marine Resources Commission (VMRC) primarily regulates the location of marine aquaculture activities through existing laws and regulations pertaining to fisheries and habitat, particularly submerged land leases and permits. The Department of Environmental Quality (DEQ) has responsibility for issuing Pollution Discharge Elimination System permits, which may be required for aquaculture facilities that discharge into state waters. The Virginia Department of Health (VDH) issues permits that ensure the safety of seafood for human consumption. In addition, local governments may require business licenses and construction permits for the development of aquaculture facilities.

Economic Value

The Virginia Agricultural Statistics Service (VASS) completed the most recent survey on commercial aquaculture in 2003, collecting information on amounts harvested, gross profits, and projected growth for the next year. Clams remained the largest and most profitable cultured species in Virginia, but oyster farming appears to be growing the most rapidly. Clam and oyster harvests are triple what they were eight years ago. (These numbers do not reflect oyster gardening, either for environmental purposes or personal consumption.)

Aquaculture Type	1995 Harvest Count/Gross/ Avg. Price	1997 Harvest Count/Gross/ Avg. Price	2003 Harvest Count/Gross/ Avg. Price	2004 Harvest Projections
Hard Clams	43,710,000 $6,993,600 $0.16	52,426,931 $11,049,000 $0.17	139,832,637 $20,327,255 $0.15	113% increase
Oysters	259,000 $62,160 $0.24	308,411 $85,832 $0.28	859,209 $212,721 $0.25	301% increase
Soft-Shell Crabs	417,705 dozen $4,840,142 $0.24	499,651 dozen $7,083,347 $14.18	241,442 dozen $3,368,739 $13.95	105% increase
All other species (e.g. seed clams and oysters)	N/a $1,159,000	N/a $1,176,176	N/a $2,646,934	N/a

Although the clam industry in Virginia continues to grow, it appears to have begun to produce more than the market has dictated. The introduction of federal crop insurance in 1998 has encouraged more people on the Eastern Shore to get involved in clam farming. The result has been very low market prices for clams. In fact, Cherrystone Aquafarms reports selling clams for less than they did 20 years ago and 25% less than in 1998.

Waters and Lands

Public: Marine aquaculture typically involves the use of State-owned submerged lands or the waters overlying the public bottom. Virginia has a long history of leasing previously "unproductive" submerged lands to individuals for the purpose of planting oysters. The use of public submerged lands and waters present potential use conflicts but also the potential for mutually beneficial public/private partnerships.

Private: During the past few decades, some individuals and corporations have used their privately leased submerged land to grow out hatchery or nursery-reared oysters and hard clams. There also has been significant recent growth in noncommercial oyster gardening. The Virginia Institute of Marine Science (VIMS) estimates about 2,000 people in the state are growing between 1000 and 5000 oysters each for environmental purposes (water quality improvement) and personal consumption, which together constitute a significant economic impact. Disease-resistant oyster seed is purchased from commercial hatcheries, and floats are either purchased as a unit or built from purchased materials.

Current Aquaculture Research Issues

Non-Native Species: Virginia's native oyster population has been in rapid decline since the 1950s, due to the parasites MSX and Dermo as well as over-harvesting, loss of habitat, and pollution. As an attempt to stimulate the declining industry commercial oyster industry, studies introducing non-native oysters to Virginia waters have been happening since the early 1990s. The most recent and promising species is *C. ariakensis*- commonly referred to as Asian oysters. Studies have found these oysters grow rapidly, are highly resistant to MSX and Dermo, and are

commercially viable. However, scientists are still concerned about their interaction with native oysters and their ability to survive among the predators of Virginia's coastal waters.
The Virginia Coastal Program partially funded the study *Non-Native Oysters in the Chesapeake Bay,* completed by the National Academy of Science. The study looked at three possible management options: 1) Prohibit introduction of non-native species, 2) Allow open water aquaculture of sterile non-native oysters, 3) Introduce reproductive non-native oysters. The study concluded option 2 as the most suitable for two main reasons. First, it allows for more time to study the biology of the non-native oyster, its impact on the Bay, and the most proper way to manage its introduction. Second, it lessens the risk of introducing non-native species illegally.

Reef Building: Since its inception in 1999, the Virginia Oyster Heritage Program (initiated by the Virginia Coastal Program) has successfully constructed over 80 oyster reefs in the waters of the Chesapeake Bay and the seaside of Virginia's Eastern Shore, providing the resources necessary for oyster settlement and growth. These reefs are often populated with disease-resistant oysters from commercial hatcheries as well as noncommercial oyster gardeners.

Disease Resistant Strains: In March and April of 2005, a collaboration of federal, regional, and state agencies placed 15 million disease resistant oysters into the Great Wicomico River. The goal is for the oysters to spawn during summer 2005, and survive the diseases that usually kill oysters within 2-3 years. Previous large scale restoration efforts in the Rappahannock River focused on providing reef structure with some seeding using disease-resistant strains. The Wicomico experiment is using much larger numbers of disease-resistant strains in a smaller river system in hopes that oysters will not cross-breed with local strains, thereby retaining their disease-resistant qualities. Results to date have not been promising.

2. Briefly describe environmental concerns. Also, describe any use conflicts (e.g., navigational, aesthetic, incompatible uses, public access, recreation), and future threats (e.g., shoreline defense works, introduced species).

A study commissioned by the Coastal Program, undertaken by VIMS scientists, identified the following environmental concerns, use conflicts and future threats. A second effort undertaken through the Seaside Heritage Program began development of Best Management Practices that address these issues. Both are described in the Management Characterization section. *(See below.)*

Environmental Concerns
Water Quality and Nutrient Dynamics: Nitrogen levels in Virginia's coastal waters, especially the Chesapeake Bay, are higher than they should be. Clam aquaculture does help to reduce nitrogen levels and improve water quality, although not as efficiently as oysters. Clams take in nitrogen by feeding on phytoplankton, which in essence removes nitrogen from the water, thereby improving water quality. However, through respiration, a portion of that nitrogen is released back into the water as ammonia and nitrate.

Waste Management: Waste from aquaculture farms has been identified as a new environmental concern. Poles, sandbags, netting, rebar, and other materials are often neglected or lost and are found washed up on shore or lodged on the bottom. The greatest environmental concern,

however, is the plastic netting used to cover the clam beds. This netting gets torn, lost, or forgotten and often lands on shorelines or floats free where it can harm various aquatic life. The Virginia Eastern Shorekeeper, a non-profit partially funded by the Coastal Program's Seaside Heritage Program, has mapped locations of this netting on the Eastern Shore and is currently looking at what happens to this netting once it is discarded. However, the types and extent of actual harm to aquatic habitat have yet to be fully studied or characterized.

Clean water is critical to the shellfish growing industry. However, growers themselves may contribute to contamination of water quality through fuel/oil leaks from their boats, or other practices that contaminate water.

Use Conflicts

Impact on Submerged Aquatic Vegetation (SAV): Habitat for clams and SAV can overlap slightly. Although clams are often raised in the shallower, intertidal zone, they also thrive in slightly deeper waters. SAV is usually found in deeper waters, but can find its way into shallower water in areas where water quality and clarity have been improved by the clams. Currently, clam aquaculture is not permitted where SAV already exists, but is permitted if the clams were there first and SAV came in later. However, there is question as to whether this will continue in the future. SAV restoration is a priority for Virginia. If shellfish growers are required to relocate in the future, the industry could be significantly impaired. This conflict was initially detailed in the Coastal Program-funded VIMS study, *"Shallow Water Resource Use Conflicts: Clam Aquaculture and Submerged Aquatic Vegetation."*

Threats to Biodiversity: This is an unquantified threat, however, there is concern that clam aquaculture may be eliminating biodiversity by turning large areas of benthic bottom into a monoculture. More research and data will be needed to determine if this is a serious threat and, if so, causes and potential solutions. Through the Coastal Program's Seaside Heritage Program, biologists from VIMS and the Center for Conservation Biology are studying potential use conflicts between clam farming and shorebird habitat.

Aesthetics: Aesthetics has become a major new issue on the Eastern Shore. Sting Rays can devastate a clam crop, so clam growers often protect their plot with PVC pipes or rebar that protrude above the water, sometimes spaced only one foot apart. While the grower's lease is for the bottom and they technically have no legal rights (see "Management Characterization" below) to impact areas above water, this is difficult to enforce. The conflict is greatest on the Eastern Shore between shellfish growers and homeowners/vacationers who view the rebar or PVC as unsightly. This situation is exacerbated when new property owners are not informed of aquaculture activities occurring near their property prior to purchase.

Future Threats

New Harvesting Methods: Experts foresee that new harvesting methods will be developed in future years and that, in the absence of regulation about harvesting methods as well as the absence of an industry association that could monitor and self-regulate harvesting, these new methods are likely to affect clam health, benthic communities, water column turbidity, and nutrient levels. This is an issue that bears attention by the state.

Introduced Species and Disease Management: One significant threat arises from diseased shellfish moving from disease endemic areas to disease free areas. This can happen when a grower discovers the presence of a disease and attempts to move his stock before it becomes completely infected. The movement of shellfish may also introduce disease across state boundaries along the Atlantic or other waterways, which is nearly impossible to regulate. For example, clams introduced from South Carolina and Florida have a greater susceptibility to the disease Quahog Parasite Unknown (QPX). While permits are required through VMRC to bring clams from these infected waters, enforcement is nearly impossible.

Management Characterization

1. Identify significant changes in the state's ability to address the planning for and siting of aquaculture facilities since the last Assessment (new regulations, guidance, manuals, etc.). Provide the following information for each change:

- **Characterize the scope of the change**
- **Describe recent trends**
- **Identify impediments to addressing the change**
- **Identify successes**

The principle management challenge confronting Virginia is to ensure suitable places for aquaculture in the future and that conflicts with other uses and resources are minimized. Contributing to this challenge is the collapse of the Virginia Shellfish Growers Association in December of 2003, which has left the industry without a self-governing body.

Water Column Leasing

For more than a decade there has been interest in expanding shellfish aquaculture activities into the water column through the use of floats, racks and trays. The improper siting of such structures has the potential to interfere with more traditional uses of the water such as fishing, navigation and recreation. As a part of a grant provided by the Coastal Program for Aquaculture Management, the Virginia Marine Resources Commission (VMRC) developed a proposal to create a water column leasing program in Virginia. The amendment, *Water Column Leases for Aquaculture Purposes*, authorizes VMRC to "lease the water column above certain state-owned bottomlands for aquacultural purposes." On April 15, 2004, the Virginia General Assembly approved the amendment to Chapter 16, Title 28.2 of the state code. Once funded, this amendment will provide the aquaculture industry with necessary water rights and protection while minimizing potential conflicts with other user groups and existing natural resources. However, the bill is only effective if the General Assembly earmarks state funding for the specific purpose. As of July 1, 2005, funding was not provided for fiscal year 2006.

Best Management Practices (BMPs) for Shellfish Aquaculture

Through the Coastal Program's Seaside Heritage Program, VIMS scientists began developing Best Management Practices (BMPs) for Shellfish Aquaculture in 2003. The lack of a central group to facilitate "buy in" from the various aquaculturists makes implementing industry-wide changes quite difficult. This list of BMPs attempts to address the environmental concerns, use conflicts, and future threats to the aquaculture industry. With funding from the Coastal Program, the Virginia Eastern Shorekeeper will work with individual clam farmers to persuade them to adopt these practices.

- *Nutrient Dynamics:* Two BMPs are associated with nutrient dynamics: 1) Develop ways to understand the "equilibrium" number of clams to grow in a tributary, creek, or bay that filters out nitrogen and minimizes additional seaweed growth; 2) Control overgrowth of algae and seaweed by removing it and depositing it upland.)
- *Water Quality:* Self-report and control water quality issues associated with aquaculture.
- *Waste Management:* "If you bring it into the system, you bring it out." Shellfish farmers should ensure that all tools and materials used in the water for their livelihood are removed from the water when no longer being used.
- *Impact on Submerged Aquatic Vegetation (SAV):* A sustainable balance between these two uses of estuarine bottomlands should be strived for. Studies will need to be done to understand what that balance is and how to determine it on a case-by-case basis.
- *Threats to Biodiversity:* More studies to be done. As the extent of how different farming practices affect biodiversity is better understood, action should be taken to prevent it.
- *Aesthetics*: There should be a balance between safety and aesthetics. All BMPs regarding aesthetics will have to be developed on a site-by-site basis.
- *New Harvesting Methods:* New methods of harvesting should be rigorously reviewed to understand their impacts on shellfish, the Bay, and other species. Once new methods have been reviewed, specific BMPs can be developed for them.
- *Introduced Species and Disease Management:* Growers should be required to adhere to VMRC inter-coastal water regulations. Long term: Develop a better understanding of the genetics of shellfish stock and susceptibility to disease.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy.

Several needs and gaps must be addressed if Virginia aquaculture is to continue to grow. Perhaps the most significant gap is the lack of funding for the legislation that enables leasing of a water column. Without funding for this program, the industry will continue to be faced with use conflicts that cannot be resolved.

The consumption of contaminated oysters from private oyster gardens is also a concern. Although oyster gardeners are required to register with VMRC, this is not always enforced. Without an enforced permitting process, it is difficult for health officials to know where oyster gardening is occurring and the magnitude of risk from oysters consumed from oyster gardens. The Tidewater Oyster Gardeners Association (TOGA) provides annual workshops and

newsletter information on the risks of oyster consumption to its members but not all oyster gardeners are members of oyster gardening associations. Increased water quality monitoring combined with continued educational efforts are necessary to maintain public health.

There is a need to further refine the Aquaculture BMPs developed by VIMS so that they can be applied at specific locations. There also is a gap between those BMPs and the ability to get industry buy-in and compliance with them. A mechanism will need to be developed to educate people and enforce compliance. The development of an Aquaculture License in Virginia, while bound to spark controversy, could offer a way to ensure that growers are conforming to regulations.

To protect the aquaculture industry from encroaching coastal development, a Development BMP handbook could direct attention to the need for more intensive Development BMPs near aquaculture activities, and could recommend that local governments and planning districts consider the creation of "aquaculture overlay districts" which would require more intensive BMPs. These districts can be created by designating an Environmentally Sensitive Zone adjacent to aquaculture areas. While these districts are already available as a planning tool, localities may need more education in how to put them in place.

Another major issue is the threat of development along Virginia's coast, especially the Eastern Shore. New developments along the shoreline are making it increasingly difficult for aquaculturists to make a living. New housing development and more traffic causes more polluted runoff to enter waterways which can be extremely harmful to shallow clam beds. A cooperative effort between state and local governments could help develop mutually beneficial solutions to this issue.

There is also concern from within the industry that subleasing is becoming more and more of an issue. The availability of intertidal areas suitable for clam aquaculture is becoming scarcer as the industry grows. Many people, who have held leases for aquaculture for years, have stopped practicing aquaculture themselves. Instead, they sublease at a large mark-up, hindering the ability of clam aquaculturists to make a profit. The state grants the original lease for only $1.50 per acre. However, the sublease mark-up is often over $10,000 per acre. This is allowing private individuals to capitalize on what is the "public trust." VMRC could find new revenue for enforcing its regulations and implementing the Water Column Aquaculture Lease program by increasing the cost of a lease and eliminating the practice of subleasing.

Virginia remains committed to the expansion of aquaculture in coastal waters as a mechanism for establishing sustainable fisheries. The previous assessment stated that a lack of consistent action would minimize opportunities for aquaculture to grow. The next steps could involve actually developing an enforceable plan for aquaculture that uses the aquaculture site suitability model, the 3-d leasing permit, and the BMPs developed with Coastal Program funding to create a productive, orderly, reliable, and efficient aquaculture industry.

2. What priority was this area previously and what priority is it now for developing a 309 Strategy and designating 309 funding and why?

1997 Assessment		Last Assessment (2000)		This Assessment (2005)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

Implementation of the changes proposed in the previous Section 309 strategy for aquaculture remains a high priority for the Coastal Policy Team. Water-column leasing permits for aquaculture and industry-wide recognition of Aquaculture Best Management Practices will be important aspects to the healthy growth of the industry.